ID: 2

TITLE: SOME SCARS DON’T RUN DEEP: THE QUALITATIVE AND QUANTITATIVE NATURE OF NEONATAL SELDINGER-INSERTED PIGTAIL CHEST DRAIN SCARS

AUTHORS: Leo Gundle 1; Aimee Dowek 2; Priya Heer 3; David Bartle 4; Steve Jones 5

AFFILIATIONS: 1 University of Bristol; 2 and 3 University of Exeter; 4 Royal Devon and Exeter Hospital; 5 Royal United Hospitals Bath

CONTENT:
Pneumothoraces can occur as a complication of mechanical ventilation, used to treat respiratory distress syndrome. If significant, a chest drain may be inserted using the Seldinger technique. This involves making a small incision in the fifth intercostal space, midaxillary line, where a small tube is inserted into the chest cavity, allowing the air to be drained and the lungs to re-inflate.
The neonatal intensive care units (NICUs) at both Royal Devon and Exeter Hospital and Royal United Hospital in Bath use pigtail drains which require a smaller incision in comparison to the traditional drain. Nevertheless, it is an incision which may leave scarring.

Interview:
Parents were interviewed by phone. Researchers asked open questions, designed to understand how scars may emotionally affect the parent, or serve as a traumatic reminder.

Data Collection:
Interviews were anonymised, and key answers to questions were documented verbatim. Common themes which arose were collected and coded. Parents were asked to take a photograph of their child’s scar. These were anonymised, stored securely, and subsequently graded.

Grading System:
The Stony Brook Scar Evaluation Scale was used to analyse the photographic data.
The best possible score is five, indicating a well-healed and inconspicuous scar. The lowest possible score is zero. The scale uses the following five criteria: Scar height, colour, width, the presence of suture marks and general appearance.

Qualitative:
Just under half of the mothers (4/9) agreed the sight of their child’s scar triggers emotional and traumatic memories. The remaining mothers, however, reported that the scar was of no particular significance, with one mother saying “Scar or no scar, the memory is always with you.”

Most mothers (6/9) reported that the scar itself doesn’t carry with it any negative emotional significance, and that if it did, it would be due to it acting as a reminder of a worrisome time in the NICU.

Almost all mothers (8/9) said that the scar size isn’t important, with one mother summarising “it wouldn’t matter if the scar was redder or angrier, it would remind me as much either way.”

Quantitative:
The mean score according to the Stony Brook Scar Evaluation Scale was 4.3. The best possible score is 5, which illustrates a well-healed scar.

Whilst mothers may have a negative emotional reaction to their child’s chest drain scar, they generally do not regard its size as an important feature. Results imply that the chest drains with the greatest efficacy should be used in practice. The pigtail drain, inserted via the Seldinger technique, is quicker and easier to insert than alternatives, and it is as effective. It is therefore a good option for the treatment of a neonatal pneumothorax.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
**ID:** 4  
**TITLE:** Immunological criteria of development of the Sepsis of Newborns with Respiratory Pathology on Mechanical ventilation  
**AUTHORS:** Marina Pukhtinskaya 1; Vladimir Estrin 2  
**AFFILIATIONS:** Department of Anesthesiology and Critical Care Medicine, State Medical University, Rostov-on-Don, Russia.

**CONTENT:**

the sepsis diagnostics during the pre-clinical stage remains a most complex issue in neonatology. Purpose: increasing the efficiency of sepsis diagnostics.

the randomized controlled clinical testing was performed on 200 full-term newborns with respiratory on Mechanical ventilation; no clinical signs of bacterial infection. On the 5 and 20 days the plasmic concentration of IL-1β, IL-6, IL-8, TNF-α, G-CSF, s-Fas, FGF, NO was determined by ELISA; CD3, CD4, CD8, CD69, CD71, CD95, HLA-DR, CD34, CD14, CD56, lymphocytes with expression AnnexinV-FITC+PI-, AnnexinV-FITC+PI+ were determined by means of immunophenotypical. By applying the statistical cluster population analysis of the immunological criteria under study we have evaluated the feasibility of sepsis diagnostics at the admission to the intensive therapy unit. The diagnostic rule for sepsis has been formulated By applying the "decision tree" approach to the "R" statistic medium.

The cluster analysis confirms the presence of two clusters (presence of absence of sepsis; these two components explain the 60.81% of the point variability).

The diagnostic rule for the early diagnostics of sepsis is as follows: disease develops providing during the first 24 hours CD95≥16.8% and NO≤9.6 mkmol/l or CD95≤16.8% and CD34≤0.2% and CD69≥4.12% or CD95≤16.8% and CD34≤0.2% and CD69≥4.12% and lymphocytes with expression AnnexinV-FITC+PI≥12.3%.

The accuracy of this diagnostics amounts to 95.41%; sensitivity to 97.06%; specificity to 94.67%; diagnostic false positive share to 5.33%; diagnostic false positive share to 2.94%; positive result accuracy to 89.19%; negative result accuracy to 98.61%.

Of the 200 patients accepted, 45 newborns featured the confirmed sepsis development.

A substantial part in developing sepsis is due to the prevailing of the alteration of immunocompetent cells over the proliferation and endogenic synthesis of NO.

The aggregate determination of CD95+, CD69+, AnnexinV-FITC+PI-, CD34+ and the plasmic concentration of NO enables the pre-clinical diagnostics of sepsis development.

**IMAGE / TAB:**

**IMAGE / TAB CAPTION:**

**COI:** none declared
ID: 8

TITLE: CEREBRAL INJURES IN EXTREMELY LOW BIRTH WEIGHT NEWBORNS

AUTHORS: Atanasova V 1, Georgieva D 2, Veskov L 1, Valerieva E 1, Asanova A 2

AFFILIATIONS: 1 Clinic of Neonatology, University Hospital of Pleven, Bulgaria
2 Home of medical and social care for children, Pleven, Bulgaria

CONTENT:

Background: Newborns with birth weight < 1000 grams (ELBWNs) are exclusively vulnerable to different complications. Intraventricular haemorrhages (IVH) are assumed to be typical life-threatening early complications for these patients. The long term outcome is burdened by different pathomorphological cerebral injures (internal and external hydrocephaly, porencephaly, cerebral cysts) which are a result of the IVH-evolution or complications (periventricular leucomalacy, hypoxic-ischemic damage etc.).

Objective: To evaluate the incidence and risk factors for IVH and residual cerebral damages (RCD) in ELBWNs.

Material and methods: One hundred eighty-two ELBWNs for a 13-year period are examined (2005-2017), all of whom treated in the Clinic of Neonatology of University hospital, Pleven and followed up to the discharge (death or discharge at home). Five newborns are excluded because of life-incompatible congenital anomalies. The remaining patients are divided in two groups: without IVH – Group A, and with IVH – Group B. The survivors to the discharge at home are divided in Group 1 (without RCD) and Group 2 (with RCD). The diagnosis of cerebral morphology is performed by transfontane echography or via autopsy. All anatomical stages of IVH are included.

Results: Sixty-three of all 177 newborns are diagnosed with IVH (35.6%). These babies are more immature (25.7±1.7 vs. 27.1±2.3 gestational weeks; p 0.0001), more often are conceived via in-vitro fertilization (29 vs. 15%; p 0.03), less often suffer from intrauterine hypotrophy (14.3 vs. 28.3%; p 0.03) and more often from inborn infection (46.6 vs. 28.3%; p 0.04), have significantly higher mortality (55.6 vs. 39.9%; p 0.007) compared to Group A. Fifteen from 97 survivors to the discharge at home are diagnosed with RCD (15.5%). The babies of Group 2 are more often twins (60 vs. 34%; p 0.05), more often suffer from nosocomial infections (92.9 vs 58.5%; p 0.01), IVH (73.3 vs. 20.7%; p 0.0000) and patent ductus arteriosus (46.7 vs. 18.3%; p 0.02).

Conclusions: According to our data, one third from ELBWNs suffer from IVH. The risk factors are mother’s medications compromising the coagulation, extreme immaturity, inborn infection. Fifteen percent of the ELBWNs suffer from RCD. The risk factors are multiple birth, IVH, nosocomial infection and severe respiratory problems complicated by patent ductus arteriosus.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 17  
TITLE: RISK FACTORS OF SEDATION FOR IMAGING STUDIES IN NEONATAL INTENSIVE UNIT INFANTS.  
AUTHORS: Moonsung Park, Janghoon Lee  
AFFILIATIONS: Department of Pediatrics, Ajou University School of Medicine, Suwon, Korea  

CONTENT:  
The demand for radiologic precision imaging studies such as magnetic resonance (MR) or computed tomography (CT) is increasing in neonatal intensive care unit (NICU) infants due to their excellent image quality. Because the imaging studies are often indicated to relatively unstable infants, there are many potential hazards to be aware of such as temperature, hemodynamic and/or ventilation instability during transport and procedure. Moreover, sedation for these imaging studies, which always poses potential risks, is often required. The aim of this study is to investigate the incidence of adverse events and associated risk factors of sedation for imaging studies in NICU.

Charts of NICU infants who underwent sedation with chloral hydrate and/or midazolam for imaging studies during Sep. 2013 to Aug. 2018 were retrospectively reviewed. Among 947 infants, 601 infants who breathed spontaneously with or without supplemental oxygen were enrolled. Their mean gestational age (GA) at birth and corrected GA at sedation were $35+6 \pm 4+6$ weeks and $39+6 \pm 3+5$ weeks. The number of infants took chloral hydrate, midazolam and chloral hydrate plus midazolam were 230(38.3%), 64(10.6%), and 307(51.1%), respectively. The adverse events were recorded for 48 hours after the medication. Multiple logistic regression analysis according to the patients’ condition were made to compare infants with adverse event group (AE)($n=143,\ 23.8\%$) and non-adverse event group (NAE)($n=458,\ 76.2\%$).

The post-sedation adverse events included oxygen desaturation (10.6%), arrhythmia (4.8%), apnea (4.2%), aspiration (4.0%), irritability (3.0%), cardiac arrest (0.5%) and sedation failure (1.5%). AE was younger in GA at birth ($36+2\ [29+0;\ 38+5]$ vs. $38+1\ [34+2;\ 39+4],\ p<0.001$) and corrected GA at sedation ($39+0\ [36+1;\ 41+0]$ vs. $40+1\ [38+2;\ 41+6],\ p<0.001$). There were more cardiopulmonary problems (26.9% vs. 14.3%, $p<0.001$) in AE than NAE, while the incidence of central nervous system problems were not different (51.5% vs. 47.1%, $p=0.727$) at the time of sedation. The use of chloral hydrate plus midazolam and chloral hydrate alone in AE (68.7% vs. 46.0%) and NAE (20.9% vs. 43.3%) were different ($p<0.001$). In multivariate analysis, cardiopulmonary problems at the time of sedation was only significant variables out of those significant in univariate analysis (OR 2.29, 95% CI 1.41-3.72, $p<0.001$).

Although most of the adverse events were transient that did not require treatment, some infants needed resuscitation. These adverse events were significantly associated with infants’ physical condition such as corrected GA at sedation or cardiopulmonary problems. We may need to individualize sedation protocol rather than using generalized one or develop guidelines without giving sedation would be more appropriate in the future.

IMAGE / TAB:  
IMAGE / TAB CAPTION:  
COI: none
ID: 21

TITLE: CHALLENGE-RESPONSE CARDS TO ADDRESS HUMAN FACTORS IN A NEONATAL TRANSPORT SETTING

AUTHORS: Rebekka Jones 1
James Tooley 2

AFFILIATIONS: 1 Neonatal Emergency Stabilisation and Transport Team, St. Michael’s Hospital, Bristol, UK
2 Neonatal Emergency Stabilisation and Transport Team, St. Michael’s Hospital, Bristol, UK

CONTENT:
Challenge-response checklists are frequently used in high risk industries such as aviation to improve safety by standardising responses to sudden or critical changes in conditions and reducing error associated with human factors. Neonatal transport constitutes a high risk clinical setting and the team caring for the infant is usually small consisting of only two or three members. Clear communication and good team-working are crucial in response to any possible deterioration of the infant’s condition in order to allow prompt identification and appropriate management of the underlying issue. We felt that the introduction of challenge-response cards in our setting might provide a useful tool to improve patient safety during neonatal transfers.

We designed cards for eight emergencies that might be encountered during the stabilisation and transfer of neonates receiving intensive care. Each card consists of a series of prompts (see example card) and is designed to be read out by one team member in order to assist with rapid resolution of the problem. All cards were trialled as part of ‘skills and drills’ training and staff were asked to give feedback on each card.

The cards were adapted according to the feedback provided and subsequently implemented for use. They are attached to our transport trolley for ease of access during transfers and a pocket version is also available. The majority of staff felt very positive about the introduction of the cards and agreed that the checklists would provide useful prompts during emergencies, aid communication and facilitate shared decision-making.

Using these cards within our neonatal transport team should support effective team-working in response to a change in an infant’s condition using a logical step-wise approach, improving situational awareness and hence patient safety.

IMAGE / TAB:
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=20f8a8d2c9f7ab11552d632603a554e-MjAxOS0wNSM1Y2UyNjY2OTRj

IMAGE / TAB CAPTION: Example card. Ventilated patient - rising end-tidal CO2

COI: None declared
ID: 53

TITLE: THE HAEMODYNAMIC PROFILE OF LATE PRETERM INFANTS OVER THE FIRST 48 HOURS OF AGE: A NON-INVASIVE CONTINUOUS CARDIAC OUTPUT MONITORING STUDY

AUTHORS: Alessia Cappelleri1,2; Neidin Bussmann1; Susan Harvey1; Phillip Levy 3; Orla Franklin4; Afif EL-Khuffash1,5.

AFFILIATIONS: 1 Department of Neonatology, The Rotunda Hospital, Dublin, Ireland. 2 Neonatal Unit, Azienda Ospedaliera Universitaria Integrata, Verona, Italy. 3 Division of Newborn Medicine, Boston Children’s Hospital, Boston, Massachusetts, USA. 4 Department of Paediatric Cardiology, Our Lady’s Children’s Hospital Crumlin, Dublin, Ireland. 5 Department of Paediatrics, School of Medicine, Royal College of Surgeons in Ireland. Dublin, Ireland.

CONTENT:
Non-invasive cardiac output monitoring (NICOM™) using bioreactance facilitates continuous assessment of haemodynamic parameters. Several studies have assessed the reliability and validity of this technique in various neonatal populations demonstrating its utility for trending changes in left ventricular output (LVO), stroke volume (SV) and total peripheral resistance (TPR) overtime. In this study, we aimed to assess changes in those parameters in stable late-preterm infants between 30 to 34 weeks gestation over the first 3 days of age.

Late preterm infants born between 30+0 and 34+6 weeks gestation were considered for this study. Infants were excluded if they developed other morbidities during their hospital stay or if there was evidence of chromosomal anomalies or dysmorphic features. NICOM was used to obtain non-invasive measurements of LVO, SV, TPR, heart rate (HR) and mean blood pressure (MBP) over a 48 hour period. Changes in those measurements overtime were assessed as % change from baseline and a graphical representation.

Twenty-nine infants with a mean ± SD gestation and birthweight of 32.7 ± 1.2 weeks and 1912 ± 370 grams respectively were included. Fifteen infants (52%) were male and 27 (93%) delivered via caesarean section. Their median [IQR] 5-minute Apgar score and cord pH were 9 [8 – 9] and 7.29 [7.27 – 7.34]. NICOM was commenced at a median of 4 [3 – 6] hours. There was an increase in LVO over the study period [mean 34%, 95% CI 21 – 47%]. This was driven by a predominant increase in SV [29%, 16 – 42%] rather than heart rate [5%, -2 – 12%]. There was an increase in mean blood pressure [11%, 1 – 21%] but a fall in TPR [-14%, -25 – -3%] (Figure). Six infants received surfactant and had a higher increase in LVO (61% vs. 27%, p=0.02), SV (57% vs. 22%, p=0.02) over the study period. There no difference in the change of HR, TPR, and MAP.

NICOM is feasible in late preterm infants and highlights an increase in LVO which is driven by an improvement in SV. This is likely to represent improved loading conditions secondly to enhanced pulmonary blood flow due to falling pulmonary vascular resistance, in addition to falling systemic vascular resistance. Surfactant administration may further augment LV preload. MBP measurement fails to illustrate those important changes.

IMAGE / TAB: https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=610458a7fb02ea8970b3659a51aafbb8-MjAxOS0wNSM1Y2UyNjY2YmMwZGY1

IMAGE / TAB CAPTION: Change in haemodynamics over the first 48 hours of assessment in the entire cohort (x axis represents hours of assessment).

COI: None Declared
ID: 63
TITLE: A review of exposure to Neonatal technical skills of level 1 trainees in a Neonatal intensive care unit – are they getting enough?
AUTHORS: Lucy Green 1; Prakash Satodia 2
AFFILIATIONS: UHCW, Coventry, England

CONTENT:
Finan et al.1 state that within paediatrics there is a risk of trainees becoming over stressed in emergencies due to their relative infrequency and the need to perform at the highest level of clinical competency within these situations. These situations include performing procedures under urgent conditions. Clinical exposure has been reduced since the introduction of the European Working Time Directive and modernising medical careers, and a government report into the effects of these changes stated that “simulation training increased the acquisition of skills. The RCPCH has recently introduced the progress curriculum. This curriculum divides practical procedures into 3 levels and also cites mandatory procedures that should be achieved by level 1 trainees.
Surgical trainees need robust evidence of number and types of operations and procedures carried out whereas neonatal trainees do not have as intensive log books. Paediatric cardiac surgeons in the UK on an average have to evidence 250 major cases, with majority in the area of special interest during their training to be competent. 2
Over the last decade due to reduction in training time and increase in advanced Neonatal nurse practioners, there is concern that neonatal trainees may not get enough exposure to technical procedures leading to poor skill acquisition and Level 2 trainees often feel less confident in regards to their technical skills when they first start their middle grade post. There is no UK wide data currently assessing the impact of this on level 1 trainees.
We chose to review technical skill training opportunities available to all level 1 trainees during their 6 months placement in our tertiary neonatal intensive care unit (NICU).
Aim
To assess overall number of, and type of technical skills performed by level 1 trainees during their 6 month NICU placement.

Methods
Retrospective review of 12 month prospective record of neonatal technical skills performed by level 1 trainees during the period of the 7th of March 2018 until 5th March 2019. The trainees were asked to keep a record of mandatory technical procedures:
- Tracheal intubation (of newborn infants)
- Umbilical venous cannulation
- Umbilical artery cannulation
- Long line insertion
- Lumbar puncture
- Chest drain/needle thoracocentesis
Each trainee kept a record of the technical procedure as observed, unsuccessful under supervision, and successful. They designed a colourful star chart system to record the outcome.

14 trainees completed the record of 7 procedures.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>No. Observed</th>
<th>No. Failed</th>
<th>No. Successful</th>
<th>Total</th>
<th>Ave per trainee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intubation</td>
<td>4</td>
<td>13</td>
<td>20</td>
<td>37</td>
<td>2.6</td>
</tr>
<tr>
<td>UVC</td>
<td>7</td>
<td>5</td>
<td>20</td>
<td>32</td>
<td>2.3</td>
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<tr>
<td>UAC</td>
<td>6</td>
<td>7</td>
<td>13</td>
<td>26</td>
<td>1.9</td>
</tr>
<tr>
<td>Long Line</td>
<td>8</td>
<td>6</td>
<td>20</td>
<td>34</td>
<td>2.4</td>
</tr>
<tr>
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<td>1</td>
<td>7</td>
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<td>15</td>
<td>1</td>
</tr>
</tbody>
</table>

6 trainees had the opportunity to perform either needle thoracocentesis or chest drain under supervision.
Despite the likelihood of under reporting due to retrospective data collection, level 1 neonatal trainees do not seem to have adequate exposure to acquire technical skills in 6 months of intensive care training before undertaking middle grade level roles. Simulation based technical skills courses can help improve level 1 neonatal trainees confidence in undertaking such technical skills.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 76

TITLE: NITROUS OXIDE INHALATION WHILST SKIN TO SKIN WITH BABY- IS IT REALLY SAFE?

AUTHORS: Sonia Goyal 1
Pinky Surana 2

AFFILIATIONS: 1. Department of Neonatology, Heartlands Hospital, University Hospitals Birmingham NHS Foundation Trust
2. Department of Neonatology, Heartlands Hospital, University Hospitals Birmingham NHS Foundation Trust

CONTENT:
Skin to skin contact (SSC) is considered beneficial to both mother and baby. The National Institute for Health and Care Excellence (NICE) recommends commencing SSC soon after birth to promote initiation of breastfeeding, promote mother-baby bonding and help in early postnatal adaptation.

Entonox (a 50:50 mixture of oxygen and nitrous oxide) is considered an easy and safe to use analgesia during delivery. NICE (2007) recommends the availability of Entonox in all birth settings to reduce pain in labour, but to inform the woman about the side effects of nausea or lightheadedness. The British National Formulary states, “Entonox may depress neonatal respiration if used during delivery.”

We report a case of a baby having sudden unexpected postnatal collapse (SUPC) whilst having SSC with a mother who was inhaling Entonox.

A term baby was born by normal vaginal delivery after an uneventful pregnancy. There were no risk factors for sepsis. The baby was born in good condition requiring no resuscitation and was placed for SSC with mum. Mother had chosen Entonox for pain management during her labour which she continued to have during suturing of her episiotomy wound.

On two occasions during suturing, the birth partner asked for the midwife to check the baby (at 15 minutes and 25 minutes post-delivery). On both occasions, the midwife took her gloves off and checked the newborn and no concerns were identified. Mother appeared incoherent during the use of Entonox singing Christmas carols.

Following completion of suturing, at 50 minutes of life, the baby was assessed again by the midwife and was found pale, apnoeic and floppy. The emergency buzzer was pulled and inflation breaths were given. Heart rate picked up soon after however, the baby remained apnoeic and comatose. Baby was intubated and ventilated before transfer to neonatal unit and pH was <7 on admission. In view of severe neonatal encephalopathy, the baby received therapeutic hypothermia for 72 hours. CFM monitoring improved from burst suppression to being moderately abnormal by 48 hours of life. The MRI brain scan on day 9 was suggestive of acute profound hypoxic-ischaemic brain injury. At discharge, the baby was breastfeeding but was slightly hypotonic.

Though a root cause for the SUPC cannot be established, neonatal airway compromise due to mother being semi-conscious or respiratory depression of the baby due to maternal Entonox use are likely possibilities. The mother should be discouraged from SSC when receiving analgesia (eg. Entonox) which causes drowsiness or alters her ability to respond to her newborn. NICE should review guidance to ensure safe implementation of SSC.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared.
ID: 80

TITLE: AN AUDIT OF CURRENT PRACTICE OF THE USE OF VAPOTHERM(HFNC) IN TERM MEONATES IN A DISTRICT GENERAL HOSPITAL WITH AN AIM TO DEVELOP A LOCAL BEST PRACTICE GUIDELINE

AUTHORS: Sonia Goyal 1
Cathryn Seagrave 2

AFFILIATIONS: 1. Department of Paediatrics, The Hereford County Hospital, Hereford, United Kingdom
2. Department of Paediatrics, The Hereford County Hospital, Hereford, United Kingdom

CONTENT:
Nasal high-flow therapy (nHFT) is used for non-invasive respiratory support in the neonates and paediatrics. This has been introduced as an alternative to CPAP with little evidence in this population. We observed variations in the use of high flow therapy within the unit with some babies having an only brief period of therapy and minimal/no oxygen requirements. We, therefore, decided to evaluate the current practice and formulate a guideline to try and reduce variance in practice and improve patient care.

Aim- To evaluate the current practice for the use of Vapotherm in term neonates with signs of respiratory distress and to formulate a local guideline.

This was a retrospective study looking at term neonates admitted to the neonatal intensive care unit with respiratory distress requiring respiratory support. The high flow was introduced in September 2015. Term babies (≥37 week’s gestation) who received high flow over a 3 year period between 2016-2018 were identified from the Badgernet database. We looked at the indication, prior management, flow rate both initial and weaning, maximum Oxygen required, causes of failure, duration, discharge diagnosis, feeding while on high flow and outcome using the case notes and the badgernet record.

During this 3-year period, 28 eligible babies were identified. In all babies, Indication for the commencement of Vapotherm was nasal flaring/grunting. Most of the babies were commenced on the high flow at the time of admission. In 3 babies it was used as stepdown. Initial flow rate varied between 1-2L/kg and the weaning flow rate was 1 L irrespective of the time, work of breathing and blood gas result. All babies had blood gas prior to commencing the Vapotherm. Maximum FiO2 used varied between air to 100%. Increased oxygen requirement and increased work of breathing was the cause of failure in 2 and 1 patients respectively. 4 patients were transferred out for further management. The most common discharge diagnosis was respiratory distress syndrome in 17 babies. The total duration of Vapotherm varied between 3 and 72 hours. 18 babies were fed (orally/nasogastric) while on Vapotherm.

We observed inconsistency in practice especially starting flow rate and feeding practice. RDS was the most common discharge diagnosis instead of TTN as expected in this age group. We compared the number of babies receiving high flow against those receiving CPAP prior to the introduction of high flow, this suggested a trend to use more Vapotherm than CPAP.

This review has helped us to develop a guideline for the use of high flow in term infants.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared.
ID: 89

TITLE: A CASE OF VEIN OF GALEN ANEURYSMAL MALFORMATION IN A PRETERM INFANT: ENDOVASCULAR EMBOLIZATION COMPLICATED WITH ISCHEMIC STROKE

AUTHORS: Giulia Res 1, Laura Moschino 1, Sabrina Salvadori 1, Francesco Causin 2, Eugenio Baraldi 1

AFFILIATIONS: 1 Department of Women's and Children's Health, Neonatal Intensive Care Unit, University of Padua School of Medicine, Padua, Italy
2 Neuroradiology Unit, University of Padua School of Medicine, Padua, Italy

CONTENT:

VGAM is a rare vascular malformation caused by the dilatation of its embryonic precursor. The choroidal type consists of multiple arterial feeders draining into the dilated vein, the mural type has direct arteriovenous fistulas. Prenatal diagnosis can be made after 6-11 GA. Most of VGAM may cause a high output heart failure in the neonatal period, but it may present in infancy or later childhood. Neonatal presentation, cardiac failure and choroidal architecture have the worst prognosis, despite interventional neuroradiology with embolization have increased the chance for survival. A Bicêtre score 8-12 out of 21 characterizes neonates most likely to benefit from emergent embolization.

A preterm male neonate (34+6 GA) was born in our Unit by elective caesarean section for labour starting due to the prenatal diagnosis of VGAM at 32 GA confirmed by foetal MRI. In the delivery room, he was supported by nCPAP, FiO2 0.21. The Apgar score was 8-8 at 1-5 min. Bicêtre score at birth was 14 out of 21. Cord blood gas was normal. An echocardiogram at 1 hour of life showed cardiac dilatation, pulmonary hypertension, PFO and PDA with bi-directional shunt and diastolic reversal of flow in the descending aorta. The brain US and the MRA showed the VGAM, with direct AV fistulas draining into the prosencephalic vein (mural type). Over the first 24 hours, the infant gradually developed acute lung failure needing mechanical ventilation and signs of cardiac decompensation despite inotrope. Targeted NBCA-LUF embolization was performed via right femoral artery at 3 days of life, resulting in the exclusion of the right direct shunt, fed by hypertrophic posterior cerebral branches. During the procedure the neonate showed sudden cardiopulmonary failure due to shunt occlusion. The next day the infant developed right catheter-associated arterial thrombosis of the external iliac artery, that was treated with urokinase. This is a possible complication in preterm infants, due to their altered blood coagulation status.

A brain US on the 5th day showed IVH grade I. The patient was extubated on the 6th day. MRI performed on the 10th day showed a 40% decrease in the dilatation of the Vein of Galen, a subdural and left posterior temporal lobe hematoma and numerous small parenchymal brain hemorrhages of the white matter, therefore urokinase infusion was stopped. The infant was then sent to the pediatric neurologic ward with the program of a second procedure at six months of life. At 2 months of life, due to left ventricular dilatation (EF 46%) and only slight improvement with medical therapy, a second embolization was performed with target the left posterior cerebral hypertrophic shunt. Even this procedure was limited to a single feeder because of low body weight and cardiopulmonary instability. Control angiogram at the end of the procedure showed residual high flow feeders from both anterior cerebral arteries, with slight better opacification of MCA branches. Five 5 days later, the infant presented suspected epileptic seizures and a brain MRI relieved an acute left posterior cerebral artery stroke (left parietal lobe involvement) suspected for hemodynamic complication. Phenobarbital treatment was started. The MRI performed after 15 days demonstrated the normal evolution of the left ischemic stroke, while the cardiac US showed improvement in the EF of 59%.

In summary, this preterm neonate with a prenatal diagnose of VGAM presented cardiovascular and respiratory failure due to the high-flow AV shunts, which required two emergent embolizations. This case report demonstrates that, despite an appropriate perinatal management and the advances of interventional neuroradiology, VGAM remains a complex therapeutic challenge with high rates of morbidity.
IMAGE / TAB: https://www.eiseverywhere.com/eeselectv3/v3/events/351149/submission/files/download?fileID=3594f8d20c9a6c459e83d89ec675d0ba-MjAxOS0wNSM1Y2UyNjY2YmM4ZWQ3

IMAGE / TAB CAPTION: VGAM mural type at the MRI and US brain on the 2nd day of life (upper image), VGAM after the 1st embolization (left down), VGAM after the 2nd embolization (right down).

COI: None declared
TITLE: POSTNATAL GROWTH AND CHANGES IN BODY COMPOSITION OF VERY PRETERM INFANTS UNTIL 6 YEARS

AUTHORS: Keiji Suzuki

AFFILIATIONS: Department of Paediatrics, Tokai University School of Medicine, Isehara, Kanagawa, Japan

CONTENT: Preterm birth imposes a strong impact on postnatal growth of infants in their early life. Very preterm infants temporarily suffer from growth stunting followed by a transient catch-up growth. However, it is not well known how this distorted growth pattern in early infancy influences on future growth and body composition. The aim was to study trends of postnatal growth profile of very preterm infants till school age.

The subjects were very preterm (<32 gestational weeks) infants born at Tokai University Hospital in 2012. They were managed at the NICU and follow up at the outpatient clinic after discharge. Data on body weight (BW) and body length (BL) at birth, at 3 and 6 years of age were collected. Derived parameters of body mass index (BMI; BW/BL2) and corpulence index (CI; BW/BL3) were also calculated for analyses. Z-scores of BW and BL, %BMI and %CI relative to average values for respective ages were calculated and analysed for temporal changes over 6 years and for correlations among values at time points (birth, 3, 6 years) and changes between time points (birth to 3 years, 3 years to 6 years).

Forty-two very preterm infants were born and admitted to the NICU in 2012, out of which 39 were discharged home. A total of 23 infants (10 males/13 females) were followed up till 6 years with growth data retrieved. Infants born >28 weeks showed mostly a full catch-up growth by 3 years. Infants born <28 weeks however, showed persistence of decreased BW and BL still at 6 years. Both BMI and CI tended to be lower than normal at 3 and 6 years. Changes in BW, BL, BMI and CI from birth to 3 years correlated inversely with BW, BL, BMI and CI at birth, respectively. Similarly, BW and BL changes from 3 to 6 years were inversely correlated with BW and BL at 3 years, respectively. However, changes in either BMI or CI from 3 to 6 years were not correlated with BMI or CI at 3 years, respectively.

Both BW and BL showed a trend of persistent ‘corrective’ growth till 6 years. However, ‘correction’ of indices of body composition (ie BMI and CI) has been completed by 3 years with no more changes in later period. Further study on the outcome of this modified growth profile in early life and its influence on future health status is warranted.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: The author has no conflict of interests.
ID: 108
TITLE: HIPPOCAMPAL REDUCTIONS AND MEMORY IN PRETERM BORN CHILDREN AND ADOLESCENTS WITH GERMINAL MATRIX-INTRAVENTRICULAR HEMORRHAGE
AUTHORS: Lexuri Fernández de Gamarra-Oca 1; Leire Zubiaurre-Elorza 1, Carme Junqué, 2,3,4; Elisabeth Solana 4, 5; Sara Soria-Pastor, 6; Élida Vázquez, 7; Ignacio Delgado, 7; Natalia Ojeda, 1; María Antonia Poca 8,9.
AFFILIATIONS: 1 Department of Methods and Experimental Psychology, Faculty of Psychology and Education, University of Deusto, Bilbao, Basque Country, Spain
2 Medical Psychology Unit, Department of Medicine, Institute of Neuroscience, University of Barcelona, Barcelona, Catalonia, Spain
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CONTENT:
Preterm birth has been well-defined by the World Health Organization (WHO, 1977) as any birth before 37 completed weeks of gestation. Prematurity is one of the core sources of global childhood morbidity and mortality, though marked advances in neonatal and prenatal care units have improved the survival rate of preterm newborns (Behrman & Butler, 2007).

There are several classifications related to preterm birth; taking into account gestational age (GA) at birth, prematurity is divided into four subcategories; extremely preterm (<28 weeks’ gestation), very preterm (28 to <32 weeks’ gestation), moderately preterm (32 to <34 weeks’ gestation), and late preterm (34 to <37 weeks’ gestation). Preterm birth can also be classified attending to its clinical manifestations (i.e low-risk and high-risk prematurity). Low-risk preterm subjects are commonly considered those with a GA between 30 to 34 weeks, mild neurologic deficits, absent of perinatal comorbidity, without abnormalities in cranial ultrasound scan, and no apparent neurodevelopmental delays (Caravale, Tozzi, Albino & Vicari, 2005). On the other hand, high-risk prematurity is related with suffering a neonatal brain injury which may cause long-lasting adverse complications (Hart, Whitby, Griffiths & Smith, 2008).

During gestation, the third trimester is particularly important for brain development, which undergoes rapid maturing changes conferring more vulnerability to exogenous/endogenous impacts (Volpe, 2009). Germinal matrix-intraventricular hemorrhage (GM-IVH) is one of the main neonatal brain injuries that affects preterm newborns. Comorbidity is associated with GM-IVH and therefore these preterm babies are at higher risk of evidencing neurodevelopmental alterations. Prematurity and GM-IVH have been associated to memory impairments. However, the effects of preterm birth on the hippocampus and memory have been only studied in heterogeneous preterm samples during childhood and adolescence. Therefore, this magnetic resonance imaging (MRI) study aims to investigate the long-term effects of prematurity and of GM-IVH on the hippocampus, and its correlates with memory performance in preterm children.

The sample consisted of 60 participants, 18 preterm participants with GM-IVH (high risk preterm group), 20 preterm children without neonatal brain injury (low risk preterm group), and 22 term individuals, of both sexes and aged between 6 and 15 years old. The three groups did not differ with regards to age at evaluation, sex, laterality, parental education and behavioral variables (internalizing, externalizing and total behavioral problems). All participants underwent: i) a learning-memory assessment by means of the Rey Auditory Verbal Learning Test (learning, delayed recall and delayed recognition recall).
indexes were obtained); ii) as well as a MRI study. An MPRAGE sequence in sagittal orientation (TR / TE = 2300/2.98 ms, 1 mm3 isotropic voxel) was acquired.

High risk preterm participants evidenced lower scores in learning, delayed recall and delayed recognition subtests compared with their low-risk preterm peers (p<0.05). Hippocampal analyses showed: i) whole hippocampal volume and fimbria subfield volume were found decreased in high risk preterm children (high risk preterm < low risk preterm and high risk preterm < full-term); ii) presubiculum volume was found reduced in both preterm groups (high risk preterm < full-term and low risk preterm < full-term); iii), molecular layer volume was found decreased in high risk preterm children with GM-IVH in relation to the volumetric values showed by the full-term group. Analyses pointed out that GM-IVH mediated the relationship between the right hippocampal volume and memory performance (β=.377, p=.006). Hence, 42.97% of the variance was explained by being preterm and suffering GM-IVH.

Our results suggest that preterm birth accompanied by a neonatal brain injury such as GM-IVH had a long-lasting impact on memory performance and hippocampal volume. Furthermore, being preterm and suffering a neonatal brain injury as GM-IVH mediates the relationship between hippocampal loss and memory alterations at childhood and adolescence.

**IMAGE / TAB:**

**IMAGE / TAB CAPTION:**

**COI:** None declared
ID: 109

**TITLE:** OUR EXPERIENCE OF LESS INVASIVE SURFACTANT ADMINISTRATION (LISA) IN A DISTRICT GENERAL HOSPITAL NEONATAL UNIT

**AUTHORS:** Eveline Tucker 1; Sarah Kibble 2

**AFFILIATIONS:** 1 University of Exeter Medical School, Exeter, UK
2 Royal Devon and Exeter Hospital, Exeter, UK

**CONTENT:**
Respiratory distress syndrome (RDS) is commonly managed by exogenous surfactant delivery via endotracheal intubation. Less invasive surfactant administration (LISA) delivers surfactant directly into the trachea via a fine tube or catheter which is then removed. An increasing number of centres are considering the LISA technique because it carries a lower risk of death and broncho-pulmonary dysplasia at 36 weeks and reduces the risk of mechanical ventilation within 72 hours of birth. We are sharing our experience of LISA, following development of guidelines for LISA using video laryngoscopy and the training of staff using simulation.

We prospectively designed a data collection sheet that was completed after each LISA procedure between the 1st April 2018 and the 1st April 2019. Criteria used for LISA procedure: infants 27+0–29+6 weeks requiring FiO2 ≥0.3 to achieve SO2 > 90%, infants >30 weeks requiring FiO2 ≥0.35 to achieve SO2 > 90%. Infants experiencing apnoeas were excluded from LISA. To ensure complete data capture we searched BadgerNet using search terms “surfactant”, “surfactant administration”, and “Curosurf®”. Information was gathered regarding patient demographics, level of respiratory support, including FiO2 before and one-hour post procedure, medications used, complications, opinions of the operator and supporting staff.

LISA was performed on 11 infants with birth weights ranging from 1080g to 3853g; 90% of these infants were preterm. LISA technique reduced the need for intubation and ventilation by 80%. The mean reduction in oxygen requirement was 19% (range 8%-31%). All LISA procedures were performed by senior practitioners who felt that LISA was well tolerated. The LISA catheter was passed successfully in all cases with no more than 2 attempts. Video laryngoscopy was used for 9 patients. Adverse events included trauma from the video laryngoscope (2), self-resolving bradycardia during the procedure (3), and endotracheal intubation and ventilation secondary to apnoeas (3). Sedation varied from comfort care, sucrose to opioid analgesia. Feedback from operators prior to May 2018 requested clearer guidance on sedation. Supporting nursing staff expressed concerns about comfort of the unparalysed child.

The LISA technique was implemented in a Local Neonatal Unit and found to be well tolerated. It reduced the incidence of intubation and ventilation in infants with RDS. Complications were thought to arise predominantly from sedation choice and laryngoscope size. Video laryngoscopy was a helpful tool when learning and performing this procedure. To ensure LISA runs smoothly training and on-going review is crucial to address queries.

**IMAGE / TAB:**

**IMAGE / TAB CAPTION:**

**COI:** None declared
ID: 118

TITLE: BALANCING RISK AND BENEFIT: A QUALITY IMPROVEMENT TOOLKIT TO MANAGE NEONATAL HYPOGLYCAEMIA ON THE POSTNATAL WARD

AUTHORS: Aakarshan Mehta 1; Georgina Farmer 2; Hannah Steedman 3; Alok Sharma 4

AFFILIATIONS: Dept of Neonatal Medicine, Princess Anne Hospital, Southampton, UK

CONTENT:
Neonatal hypoglycaemia (NH) was the 3rd leading cause for admissions to NICU’s in the UK (2011-2013). Data available from the National Litigation Authority reveals 79 claims over 10 years from NH management. Damages range from £300,000 to 7 million. We noticed a rise in admissions for NH from 2015 (31/146;4%), 2016 (42/868;4.8%) to 2017 (45/889;5%). Hypothermia was identified as the most common cause. National guidance was introduced in 2017 relaxing treatment thresholds for babies at risk of NH. This allows for babies at risk of NH to stay with their mothers, allowing breastfeeding. This must be balanced against the potential that breastfeeding alone might not prevent NH. These babies need early recognition and can be treated with Dextrogel keeping them with their mothers. Symptomatic neonates need urgent treatment. A quality improvement programme (NH toolkit) was introduced in 2018 to keep baby With mother keeping the above balance in mind.

A traffic light system was developed to manage neonates at risk of NH. Babies in the Green/Yellow zone stayed with the mother. Babies in the Red zone were admitted. Preventive interventions included skin to skin care and early feeding. Dextrogel was incorporated in the pathway. Early skin to skin care and feeding within an hour of birth were promoted from February 2018. 350 staff were trained from May-September 2018 to implement the RHINO Protocol (Figure 1). 'At Risk neonates' were encouraged to have 'Red Hats' put on to prevent hypothermia and allow early recognition. Dextrogel was implemented in August 2018. Admissions due to hypoglycaemia were evaluated prospectively using run charts. Targeted education was delivered through Dextrogel workshops, lectures, simulation and short videos.

Admissions for NH decreased from 2017 (45/889;5%) to 2018 (30/762;3.9%). A comparison of run charts comparing admissions 2018 vs 2017 shows lower admissions after implementation of education regarding feeding within the hour and early skin to skin care as well as after implementation of the RHINO protocol (figure 1). Only 8/30 (26.6%) babies admitted with NH had their first feed within the hour. 17/30 (56%) of babies admitted received early skin to skin. From 1st of January 2018 to July 31st 2018 there were 15 admissions With 1 case of symptomatic hypoglycaemia and neurological symptoms. From August 1st to December 31st there were 15 admissions with no cases having neurological symptoms. 8/30 (26%) of babies admitted to the NICU were hypothermic. 9/30 (30%) of babies admitted to the NICU may have been prevented if they had received the full package of interventions including Dextrogel.

The toolkit focussed on preventive measures and Dextrogel has been associated with reduced admissions from NH. It is simple, objective, and reproducible helping to keep mother and baby together. The protocol was not always successful as some babies did not get all interventions together. This may have prevented 9 further admissions. Early feeding and skin to skin care can be improved. The toolkit has new videos to aid education in these areas.

IMAGE/TAB:
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=1a44eb51bf4cf051fa56a855e4683162-MjAxOS0wNSM1Y2UyNjY2YmQzODky

IMAGE/TAB CAPTION: Figure 1 RHINO Protocol and Run Chart

COI: None declared
ID: 128

**TITLE:** IMPLEMENTATION OF A LOCAL SAFETY STANDARD FOR INVASIVE PROCEDURES (LocSSIP) FOR NEONATAL INTUBATION

**AUTHORS:** Claire Strauss
Sarumathi Dhanapal
Lena Al-Shammari
Lesley Alsford

**AFFILIATIONS:** All North Middlesex University Hospital NHS Trust, UK

**CONTENT:**

In September 2015, NHS England published a set of National Safety Standards for Invasive Procedures (NatSSIPs) to bring together analysis of never events, serious incidents and near misses in a set of recommendations that will help NHS organisations provide safer care to patients. The principle was strongly influenced by the success of the WHO surgical checklist. These are to be modified for local use to produce Local Safety Standards for Invasive Procedures (LocSSIPs) with a LocSSIP to be in place for every invasive procedure performed.

Our hospital trust is starting to create LocSSIPs and we developed one for endotracheal intubation of a baby on the neonatal unit. This includes details in accordance with the NatSSIP standards and a checklist for the procedure.

In creating our LocSSIP we took inspiration from intubation checklists of the Children's Acute Transfer Service and the Faculty of Intensive Care Medicine. It was designed to prevent serious incidents, encourage team communication and standardise practice. The checklist also functions as an aid for trainees learning to perform the procedure and a simple means for thorough documentation.

Prior to implementing the LocSSIP we audited documentation of intubations by reviewing notes retrospectively. The LocSSIP was presented at a departmental audit meeting and opportunistically shown to staff on the neonatal unit. The checklist is now on the crash trolley which is used for most intubations. Comments and opinions were sought from people who used the checklist and it was adjusted accordingly.

We audited 41 attempts at intubation over 21 episodes. The indication for intubation and size and length of the endotracheal tube (ETT) were well recorded. Information poorly documented included the use of sedation and paralysis. In 14/21 events no method of clinical confirmation of ETT position was documented (such as bilateral air entry and chest rise) and in 9/21 episodes the position on x-ray wasn’t recorded.

The checklist is in use on the neonatal unit and feedback is being collected as people use it. Comments are very positive so far and several suggestions have been incorporated such as space for alterations in ETT position and names of assistants. Comments included:

"I felt safe and reassured by using it. The nursing staff were very keen on it and they got the checklist even before I asked for it."

"I found it very useful. Good practice, improves safety and clear documentation"

LocSSIPs are an important patient safety innovation.

Early responses by people who have used the intubation checklist are extremely positive. There have been constructive suggestions which have resulted in additions or changes to the checklist.

We will re-audit the documentation of intubations performed using the LocSSIP checklist.

We have created a chest drain LocSSIP using the same template and will do so for umbilical and long line insertion.
The neonatal intubation checklist

COI: None declared
**ID:** 130  
**TITLE:** Extensive epidermal skin loss: neonatal management challenges  
**AUTHORS:** Rebecca Calthorpe1*, Emma Spencer1*, Jane Ravenscroft1, Ting Seng Tang1, Anna Martinez2, Anjum Deorukhkar1  
*Contributed equally  
**AFFILIATIONS:** 1 Nottingham University Hospitals NHS Trust, Nottingham, United Kingdom  
2 Great Ormond Street Hospital, London, United Kingdom  

**CONTENT:**
We present a rare case of a 30 week gestation neonate presenting at birth with extensive epidermal skin loss of over 90% due to disseminated perinatal acquired Herpes Simplex type one (HSV1) infection. Differential diagnosis included Aplasia Cutis and Junctional Epidermolysis Bullosa. Serum PCR and mouth swabs confirmed HSV1. He made excellent recovery after treatment with three weeks of intravenous Aciclovir and dedicated approach and involvement of multidisciplinary regional and supra regional teams. His skin subsequently re-epithelised and he developed contractures at multiple joints as anticipated with widespread cribriform scarring which are currently being addressed.

The infant was born preterm, extremely low birth weight, at 30 weeks gestation. At birth he presented with extensive epidermal skin loss of over 90% with sparing of the soles of the feet, fingers, genital area and central face. The extent of skin loss was estimated using the Mersey burns calculator. His presentation resulted in additional management challenges to his neonatal care atypical to a neonate of this gestation admitted to the intensive care unit. We describe these in detail below and offer practical solutions applicable to the care of neonates, both term and preterm, presenting with widespread skin loss.

His skin loss affected multiple aspects of his care. It hindered monitoring of observations due to limitation of placement of leads and saturation probes. Securing definitive intravenous access for parenteral nutrition and antiviral therapy had to be achieved via umbilical arterial and venous catheters for an extended time than usual followed by a scalp long line. Additional respiratory requirements and extubation to non-invasive respiratory support had to be balanced against potential of further exacerbating skin damage to his face. Additionally high dose opioid analgesia had to be carefully tailored to avoid possible side effects of causing respiratory depression. Pain management was a significant issue requiring rapid escalation of analgesia to that not typically used with the neonatal intensive care setting, needing high dose Ketamine and Fentanyl. The phototherapy treatment and monitoring regimen needed for neonatal jaundice moderated in view of his skin due to the unknown efficacy of phototherapy and to minimise further insensible fluid losses. He also required multiple red cell and platelet transfusions. Treatment of his underlying infection involved sending Blood PCR, mouth and skin swabs which were positive for HSV1. Lumbar puncture could not be performed due to extensive skin loss on the back. Viral load based on serum PCR was the most appropriate alternative. Hence 21 days of intravenous acyclovir was completed followed by a plan to complete six months of oral Aciclovir.

He received extensive multidisciplinary approach with involvement of committed group of teams from Dermatology, the National Epidermolysis Bullosa (EB) Service, Burns and Plastics and Physiotherapy. Shave biopsy was performed very early on in his illness that was extremely useful in helping to exclude the diagnosis of EB as his immunostaining was negative. Early recognition, prompt referral to the EB team and tertiary neonatal intensive care was essential, with MDT involvement key to successful management of this neonate.

This case describes widespread epidermal skin loss secondary to disseminated HSV1. Associations with congenital abnormalities may indicate a genetic cause, however, there should be a high index of suspicion of HSV and Aciclovir should be initiated early. Given its rarity, we discussed the challenges and practical solutions for the additional treatment challenges faced when caring for a neonate with extensive skin loss of any aetiology.
COI: No conflicts of interest.
ID: 135

TITLE: Admission Laboratory Testing on Umbilical Cord Blood for NICU patients

AUTHORS: Natasha Mense-Dietrich 1, Neil Wonko1,2, Kaarthigeyan Kalaniti1,2, Sibasis Daspal1,2, Veronica M Samedi 1,2

AFFILIATIONS: 1. University of Saskatchewan, Saskatoon, SK, Canada
2. Royal University Hospital, Saskatoon, SK, Canada

CONTENT:

In the NICU, one of the largest blood losses usually happens on the first day due to admit laboratory testing (ALT). It is well known that phlebotomy loss is one of the major factors associated with increased red cell transfusions in premature and critically ill neonates. Opportunity to obtain admission laboratory tests from the otherwise discarded umbilical cord blood (UCB) may be one of the ways to prevent the development of early anemia thereby avoiding blood transfusion in an otherwise healthy preterm neonate.

Total circulation blood volume is small in extreme preterm neonates (40 ml for 500-gram infant to 90 mL to 1200-gram infant), and opportunities to minimize blood loss in first days of life are more clinically significant.

Aim: To draw initial laboratory blood tests except blood culture using fetal blood from the cord, thereby minimizing admit blood work volume in infants born at < 30 weeks of gestation.

Objective: To compare the need for PRBC transfusions in infants born <30 weeks of gestation with a similar cohort of neonates whose ALT were not done using UCB

Cord blood collection initiated for infants born at <30 weeks of gestation from January 1, 2019, to December 31, 2019. Complete blood count, differential, blood typing and direct agglutination test (DAT) will be collected simultaneously with cord blood gases collection.

The study timeline includes 12 months before and 12 months after implementation of the ALT UCB guidelines.
1. Pre-implementation (control) group: 50 infants born at < 30 weeks of gestation between January 1, 2018, and December 31, 2018.

Primary outcome: Number of blood transfusions during the NICU stay
Secondary outcome: Age of the first-time transfusion (days)

Student’s t-test for independent samples will be performed to compare the transfusion data means between groups. In the case of skewed data, Mann-Whitney U (Wilcoxon rank-sum) test will be performed. The difference between the Means and 95% CI will be calculated.

This study will help to identify the impact of the use of UCB for admission laboratory testing, which may help to minimize the need for blood transfusions.

IMAGE / TAB:
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IMAGE / TAB CAPTION: Laboratory Testing Types Distribution

COI: none declared
ID: 147

TITLE: RESTRICTIVE DERMOPATHY

AUTHORS: Jolita Jaseviciene 1; Ilona Aldakauskiene 2; Kristina Stuikiene 3; Regina Vidmante 4; Rasa Traberg 5; Tomas Navickas 6; Rasa Tameliene 7.

AFFILIATIONS: Department of Neonatology, Hospital of Lithuanian University of Health Sciences Kaunas Clinics, Kaunas, Lithuania.

CONTENT:
Restrictive dermopathy (RD) is a rare and extremely severe congenital genodermatosis, characterized by intrauterine growth retardation, decreased fetal movements because of abnormally rigid skin, erosions and epidermal hyperkeratosis, joint contractures, and pulmonary hypoplasia generally leading to death in the perinatal period. RD is caused in most patients by compound heterozygous or homozygous ZMPSTE24 null mutations. This gene encodes a metalloprotease specifically involved in lamin A post-translational processing. Prevalence <1/100000. To date, approximately 80 known cases have been described in the world literature. Two siblings from Lithuanian origin were reported in 2016.

We present a female preterm newborn who was the second child of healthy parents. The family history showed that the first one was born full term without any pathology. This second pregnancy was complicated by polyhydramnios and premature rupture of membranes. The prenatal ultrasound showed multiple fetal dysplasia. This baby was born at 30 weeks of gestational age with a birthweight 1020 g (<5‰). She was delivered vaginally. Her Apgar scores were 6/7 at 1 and 5 min, respectively. Postnatally her condition was very severe, because of progressive respiratory distress. This improved after the patient was given noninvasive positive pressure oxygen therapy and received surfactant.

Physical examination showed extensive areas of tight, scurfy, shiny, translucent skin with multiple fissures on the neck and chest, and prominent superficial vessels. Characteristic dysmorphic features were hypertelorism, exophthalmus, antimongoloid slant, sparse eyelashes, a small pinched nose, micrognathia and an 'O'-shaped mouth. Rocker-bottom feet were observed. Active movements of extremities were severely restricted, because of multiple joint contractures of the hips, knees, ankles, elbows, and wrists.

In the first few days blood test results were in normal limits and culture was sterile.

Brain ultrasound showed subependymal intraventricular haemorrhages. Abdominal ultrasound was normal. There was no pathology of cardiovascular system.

In the seventh day of life, patient's condition became critical. Skin became grayish. Respiratory condition deteriorated. Enteral feeding intolerance appeared, baby started to vomit.

A full blood count showed a leukocytosis and there was elevated serum C-reactive protein. Blood gas analysis indicated respiratory acidosis with CO2 retention.

Despite intensive care, the patient died because of sepsis (S. aureus) and cardiorespiratory insufficiency.

Autopsy results confirmed all the previously clinically diagnosed anomalies, also hypoplasia of the lungs was found. Microscopic examinations indicated an evenly thickened epidermis, hypergranulosis with large keratohyalin grains, and a decrease in the elastic fibers in the dermis. These histological findings are compatible with RD.

DNA analysis was made. A homozygous frame shift mutation c.50delA p. [(Lys17Serfs*21)] exon 1 of the ZMPSTE24 gene.

Restrictive dermopathy is a very rare and lethal genetic disease. The suspicion of this disease is based on clinical symptoms. To approve it we need to analyse DNA. In our country it is the third case during past 4 years. Possibly in our demographic region the prevalence of this disease is higher than in other countries.

IMAGE / TAB:
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IMAGE / TAB CAPTION: Neonate with restrictive dermopathy.

COI: None declared
ABSTRACT BOOK
POSTER DISPLAY

ID: 159
TITLE: WARKANY SYNDROME WITH REFRACTORY SEIZURES: A RARE CASE REPORT
AUTHORS: Deniz Anuk Ince 1; Ozden Turan 1; Zerrin Yılmaz Celik 2; Taner Sezer 1; Ali Ulaş Tugcu 1; Ayşe Ecevit 1
AFFILIATIONS: 1Pediatric Dept., University Hospital of Baskent, Ankara, Turkey
2Department Of Medical Genetics, University Hospital of Baskent, Ankara, Turkey

CONTENT:
Warkany syndrome 2 or Trisomy 8 mosaicism (T8M) is a rare chromosomal abnormality reported in 1/25,000 to 50,000 live births. We report a case of a newborn with refractory seizures who require prolonged mechanical ventilation and abnormal facial features.

A two-day-old female infant born of nonconsanguineous marriage to a 33-year-old mother by caesarean section was referred to our hospital due to refractory seizure and respiratory distress. Postnatal second day of life, she was entubated and started to have myoclonic seizures. EEG was abnormal and showed multifocal spikes. The general physical examination revealed prominent forehead, broad nasal root, cleft palate, prominent ears with prominent antihelices, hypoplastic nails, deep plantar creases, camptodactyly and clinodactyly, hypotonia, electrolytes and metabolic screening were normal (Fig. 1). Echocardiography revealed atrial septal defect, ventricular septal defect and peripheric pulmonary stenosis. Magnetic resonance imaging showed prominent vascular structure of the corona radiata adjacent to the left lateral ventricle. Chromosomal analysis on peripheral blood cultures showed: 47,XX,+8[15]/46, XX.

Warkany syndrome 2 is an autosomal abnormality with variable phenotypic and cytogenetic expression. Unlike the cases in the literature, our patient had refractory seizures and the need of prolonged ventilatory support. Cytogenetic evaluation is essential for appropriate management and follow up of this rare disorder where clinical features correlate to this syndrome.

IMAGE / TAB:
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IMAGE / TAB CAPTION: Abnormal structure of ear (a), Camptodactyly (b), Clinodactyly and hypoplastic nails (c), deep plantar creases (d).

COI: None declared
ID: 173
TITLE: Omegaven Rescue Therapy in Extremely Low-Birthweight Infant with PNALD: Case Report
AUTHORS: Jayesh Changela 1, Angela Thompson 1, Veronica M Samedi 1, Katherine Bbackman 1,
AFFILIATIONS: 1. Royal University Hospital, Saskatoon, Canada

CONTENT:
Parenteral Nutrition (PN) is an essential part of management premature neonates that significantly improved survival in this population over the last decades. Despite being life-sustaining, prolonged use of PN can cause severe complications, specifically parenteral nutrition-associated liver disease (PNALD). Experimental data showed that soybean based PN lipid preparations contribute to the development of PNALD. The risks are higher in neonates with gastrointestinal surgery because of prolonged periods of NPO, and the most intractable PNALD observed in extremely low-birthweight infants (ELBWI).

We describe a case of ELBWI with intestinal perforation and subsequent bowel resection, who received Omegaven monotherapy for PNALD.
Our patient was delivered by emergency caesarian section at 25 weeks of gestation with birth weight of 780 grams. Her hospital course was complicated by several episodes of intestinal perforation with formation of enterocutaneous fistulas (Image 1) and subsequent intestinal adhesions causing low GI obstructions. Surgical interventions and gut incompetence resulted in prolonged PN administration and absence of enteral feeds for more than 14 weeks. By the age of 2 months her serum bilirubin and liver enzymes were significantly elevated. Despite of optimization of PN and adjustment of trace elements hepatic biomarkers were rising. Aiming to minimize hepatic inflammation by soy-containing lipids, patient was started on Omegaven, a fish-oil derived parenteral lipid emulsion rich in omega-3 fatty acids. Omegaven was initiated at 0.5 gm/kg/d for 2 days, and then increased to 1gm/kg/d for the remainder of the treatment course; biochemical markers and growth parameters were obtained at baseline and weekly after initiation of therapy (Graph 1). Both serum bilirubin and liver enzymes began to decline 2 weeks after Omegaven supplementation. The infant tolerated supplementation well, no side effects related to Omegaven were noted.
Our observation supports other reports that infants who received Omegaven have a higher rate of PNALD reversal when compared to patients who received soy-based emulsion.

Omegaven, parenteral fish oil-based lipid emulsion, is effective and safe as a monotherapy in PN dependent ELBWI in postsurgical period.

IMAGE / TAB:
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IMAGE / TAB CAPTION: Image 1. Enterocutaneous fistulas as presented on DOL 15
Graph 1. Serum bilirubin trend before and after Omegaven supplementation

COI: none declared
ID: 179
TITLE: NEONATAL CONVULSIONS AND ENCEPHALITIS: THINK OF ROTAVIRUS!
AUTHORS: Alja Bijlsma 1; Marieke A.C. Hemels 1; H.L.M. (Irma) van Straaten 1; Sylvia B. Debast 2; Esther J. d’Haens 1
AFFILIATIONS: 1 Department of Neonatal Intensive Care, Isala klinieken, Zwolle, the Netherlands
2 Department of Microbiology, Isala klinieken, Zwolle, the Netherlands

CONTENT:
Rotavirus is a common pathogen causing gastroenteritis in children aged 6-24 months. In neonates, it occasionally causes central nervous system complications with convulsions based on neonatal encephalitis. Remarkably, there is almost always an absence of gastro-intestinal symptoms. We report a preterm born neonate with convulsions due to rotavirus encephalitis.

A late-preterm born neonate (36+5 weeks), weight appropriate according to the gestational age, presented 2 weeks postpartum with neonatal convulsions. Simultaneously, a sibling reported symptoms of gastro-enteritis. The convulsions were treated with fenobarbital 30 mg/kg and midazolam 0.1 mg/kg. MRI showed widespread bilateral white matter injury at the diffusion-weighted imaging. The clinical findings in combination with the specific MRI findings were suggestive for a rotavirus infection. Cerebrospinal fluid showed no pleocytosis and PCR was negative for parecho-, entero-, herpes- and rotavirus. Bacterial culture was also negative. Rotavirus PCR appeared positive in the stool, confirming the diagnosis rotavirus-encephalitis. The neonate was discharged home in good condition after 7 days. Because of the severity of the MRI findings, frequent follow-up was performed. Surprisingly, the neurodevelopmental outcome was normal at the age of 3, 6 and 12 months.

In neonates presenting with convulsions:
1) Think of rotavirus encephalitis, also in the absence of gastro-intestinal symptoms.
2) Perform lumbar puncture to exclude other neurotropic viruses, rotavirus is almost always negative.
3) Positive rotavirus PCR in the stool confirms the diagnosis.
4) Evaluate brain injury using MRI including DWI.
5) Prevention is very important because of the risk of adverse neurodevelopmental outcome.

IMAGE / TAB:
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=a864e5009ecc2e0547bf96ef9c070a7c-MjAxOS0wNSM1Y2UyNyY2YmVhYWZk

IMAGE / TAB CAPTION: Diffusion-weighted MRI paraventricular aged 2 weeks, widespread diffusion restriction left and right in the white matter.

COI: None declared
ID: 192

TITLE: Multiorgan dysfunction predicts mortality and length of stay in asphyxiated infants

AUTHORS: Miguel Alsina-Casanova 1-2, Ana Martin-Ancel 1, Marisol Leon 1, Alfredo García-Alix 1.

AFFILIATIONS: 1. Hospital Sant Joan de Déu, Barcelona, Spain
2. Hospital Clínic de Barcelona, Barcelona, Spain

CONTENT:
Perinatal asphyxia is major cause of mortality in newborn infants. Multiorgan dysfunction has been demonstrated to correlate with the severity of hypoxic-ischemic encephalopathy. However, the impact of organ injury in short-term outcomes has not been evaluated. This study aims to determine the predictive value of organ dysfunction in the first 72 hours of life in asphyxiated infants in terms of mortality and length of stay.

Newborns with hypoxic-ischemic encephalopathy admitted in Hospital Sant Joan de Déu-Hospital Clinic of Barcelona between April 2009 and December 2012 were included prospectively. The degree of hypoxic-ischemic encephalopathy was determined within the first 6 hours of life. To describe multiorgan dysfunction a quantitative scale with 7 organ-systems was applied daily in the first 72 hours of life.

Ninety-one patients with mild-to-severe hypoxic-ischemic encephalopathy were enrolled. The scale score was higher in those infants who die in the first 3 days of life (p<0.05). The ROC analysis of the scale score to predict mortality showed an AUC of 0.926 (CI 95% 0.88-0.98). On the first day of life, each organ-system presented greater dysfunction in patients who die (p<0.05). Hospital length of stay in surviving patients correlated with the scale score in the first day of life, with a Spearman correlation index of 0.712. The multivariate analysis of the organ dysfunction degree showed that severe involvement of respiratory system best predicted hospital length of stay.

Mortality and hospital length of stay in asphyxiated infants are not only related to the severity of hypoxic-ischemic encephalopathy. The severity of multiorgan dysfunction is relevant to determine short-term outcomes in asphyxiated infants. These data may allow clinicians to anticipate problems in the first days of life and identify improvement care points in asphyxiated infants.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 193
TITLE: HYDROPS FETALIS CAUSED BY CONGENITAL SYPHILIS. AN ANCIENT DISEASE?
AUTHORS: Sofia Ramis Fernandez 1-2, Miguel Alsina-Casanova2, Ana Herranz-Barbero2, Victoria Aldecoa-Bilbao2, Cristina Borrás-Novell2, Dolors Salvia-Roges2
AFFILIATIONS: 1 Paediatric Department, Hospital del Mar, Barcelona, Spain
2 Neonatology Department, Hospital Clínic de Barcelona, Spain

CONTENT:
Syphilis is currently an emerging public health problem, especially in high-income countries. Infection in pregnant women is associated with high risk of mother-to-child transmission and adverse pregnancy outcomes (early fetal death, stillbirth, preterm birth or low birth weight). Although classical clinical manifestations as bone involvement and hydrops fetalis are typically described, these cases are rarely seen in developed countries.

A case of a newborn of 32 weeks gestation is presented. It was the fourth pregnancy of a 23 years old hispanic female, with a history of two previous abortions of unknown cause and an stable relationship. The pregnancy was controlled on a primary care center from week 16. First-term serology blood test was normal including syphilis. The mother was referred to our center at 28.4 weeks of gestation, after detecting a possible right aortic arch in second-trimester ultrasound. This feature was confirmed, and she was followed weekly by ultrasound. At 32 weeks of pregnancy an hydrothorax, ascites and subcutaneous edema were detected in a routine ultrasound control. The mother was admitted in our hospital and urgent cesarean section was performed due to a non-reassuring fetal status (Altered cardiotocographic record).

A 32-week-old neonate of 2,510 grams of birthweight was born with severe hydrops. The newborn required advanced resuscitation with orotracheal intubation in the delivery room and high ventilatory pressure. Therefore, an emergent chest ultrasound was performed which showed a relevant left pleural effusion without pericardial effusion. Apgar test score was 2/3/6 and umbilical cord artery – pH 6.98. The infant was admitted in the neonatal intensive care unit where high frequency ventilation was started and a left pleural drainage was placed. Lymphocytic liquid was detected in pleural effusion. The infant presented with high pulmonary hypertension that required maximum inotropic agent doses and nitric oxide. Due to the critical status, empirical antibiotic therapy with ampicillin and cefotaxime was started from the first hour of life. The newborn developed an acute kidney failure with anuria, disseminated intravascular coagulation with requirement of repeated blood products and a massive hepatocellular necrosis with transaminases just over 5,000UI/mL. At 48 hours of life, the multiorgan failure triggered an intraventricular hemorrhage with a massive hemorrhagic stroke in the left side. Given the poor prognosis of the disease, with the family involved, the decision was made to withdrawcare and the patient died.

Within these two days, many studies were performed in order to elucidate the hydrops etiology, between them: infectious agents (Parvovirus, Enterovirus, Cytomegalovirus, and Trypanosoma cruzi), hemoglobinopathies, first line of inborn metabolic disorders, and skeletal dysplasia. Immediately after exitus, syphilis maternal seroconversion was received (reactive VDRL 1/64, Ac IgG and IgM anti T-pallidum positives) that had been requested by hydrops fetalis of unknown cause. Congenital postmortem syphilis was confirmed with VDRL test in positive cerebrospinal fluid in the neonate. Later, the father claimed to have presented genital lesions. A postmortem skeletal X-ray revealed specific signs of syphilis with a radiolucent central area and sclerotic rims (FIGURE). The treponema was not found in the necropsy, probably due to the effect of ampicillin treatment.

We report a case of severe congenital syphilis in order to emphasize that fetal infection still occurs in developed countries, although it is easily preventable and treatable. Antenatal care protocols are sometimes not accurate enough to detect the infection during pregnancy and therefore to avoid severe consequences in the newborn.
COI: None declared
Organising Institutions:

Supported by:

Powered by:

ID: 205

TITLE: CONGENITAL MYELOGENOUS LEUKEMIA IN PREMATURE NEONATE BORN AT 35+5 WEEKS OF GESTATION

AUTHORS: Kapetanaki Anastasia.1, Bitouni Polixeni 2, Salvanos Iraklis 3, Liosis Georgios 4, Tzaki Margarita 5

AFFILIATIONS: Neonatal Intensive Care Unit, General Hospital “Elena Venizelou”, Athens, Greece

CONTENT:

Background: Congenital leukemia is a group of hematologic malignancies with an intrauterine onset and manifestation at birth or in the first few weeks of life. Congenital leukemia makes up 0.8% of childhood leukemias. Trisomy 21 and 11q23 translocation are the most common chromosomal aberrations associated with neonatal leukemia. The diagnostic criteria include the presence of immature leukemic blasts in the blood and in extrahematopoietic tissues and the absence of hemolytic disease and congenital infections which may present similar clinical features. The most common type is myelogenous. We present a case of congenital myelogenous leukemia manifesting from the very first hour of birth.

CASE REPORT: A premature female neonate was born with intrauterine growth restriction (IUGR) through vaginal delivery. The gestational age was 35+5 weeks and the birth weight was 1130 gr.

The mother was minor and primiparous. In the first trimester of pregnancy she was hospitalized due to measles. Prenatal ultrasound showed hydramnios without other abnormalities and blood test for congenital infections was negative. The infant was born with severe apnea and bradycardia. Consequently, she was intubated and ventilated. Physical examination revealed severe intrauterine growth restriction, craniofacial dysmorphic features (crooked nose, large ears), lens turbidity, cutaneous petechiae of face, trunk and extremities, hepatosplenomegaly, abdominal distension and bilateral clubfoot. Bleeding occurred at venipuncture sites and hemostasis test was abnormal. The complete blood count test revealed anemia, hyperleukocytosis and the presence of immature leukemic blasts. Chest x-ray showed pulmonary hypoplasia. Death occurred within three hours after birth due to cardiopulmonary and multiple organ failure. Perinatal necroscopy examination comprised macroscopic findings and histological examination of all organs. Macroscopically visible abnormalities were hepatosplenomegaly, nephromegaly, cardiomegaly and atrial hypertrophy. Microscopic findings were the following: pulmonary hyaline membrane deposition, infiltration of liver, spleen, lungs, kidneys, adrenal glands and lymph nodes by hematopoietic cells. Immunophenotyping showed the blasts to be positive for Myeloid Markers (MPO+, CD15+). Similar cell populations were mobilized massively into systemic circulation vessels. The clinical and histological findings are compatible with congenital myelogenous leukemia.

CONCLUSION: Congenital myelogenous leukemia is a rare disease that originates in utero with a very poor prognosis. Clinical signs of leukemia may be evident at birth or within a short time period after delivery. Survival time is brief.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 206

TITLE: THE EFFICACY OF DEVELOPMENTAL CARE INTERVENTIONS IN PROCEDURAL PAIN MANAGEMENT DURING BLOOD SAMPLING AND CENTRAL LINE INSERTION IN VLBW, LBW AND FULL TERM NEONATES IN NICU

AUTHORS: Kapetanaki Anastasia.1, Dritsakou Kalliopi.2, Salvanos Iraklis3., Tzaki Margarita 4

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2 Department of Quality Control, Research and Continuing Education, General Hospital “Elena
3, 4 Neonatal Intensive Care Unit, General Hospital “Elena Venizelou”, Athens, Greece

AFFILIATIONS: 1, 3, 4 Neonatal Intensive Care Unit, General Hospital “Elena Venizelou”, Athens, Greece
2 Department of Quality Control, Research and Continuing Education, General Hospital “Elena Venizelou”, Athens, Greece

CONTENT:

BACKGROUND: Neonates are capable of experiencing pain irrespective of gestational age, but the response to pain may differ with gestational age. During the prolonged neonatal hospitalization repetitive painful experiences cause physiologic changes that can be linked to intraventricular hemorrhage (IVH) or periventricular leukomalacia (PVL). Developmental care interventions that provide comfort are correlated with optimal brain development. Pain is a subjective experience and although objective measurement is difficult, facial and body actions may be a useful tool in pain assessment. Aim of the study is to relieve neonatal pain by practicing developmental care interventions.

METHODS: During a 5 month period, pain was assessed in 57 neonates (31.6% VLBW, 45.6% LBW, 22.8% full term) during routine blood sampling and central line insertion. The unit’s developmental care protocol includes: incubator cover, nesting, massage, non-nutritive sucking via pacifier, milk feedings. Blood sampling techniques were venepuncture and heel lance. Blood sampling was performed the first time without developmental care interventions and the second time it was performed using interventions. Pain was assessed using the ALPS-Neo Pain and Stress Assessment Scale (table 1). An infant in a balanced state shows organized behavior, which corresponds to the scale’s score of 0 in the respective behavioural items. A high total sum means that the infant is in a state of total imbalance.

RESULTS: The results showed significant differences between the control and the intervention stages in terms of pain scores. Mean gestational age and mean body weight at birth, mean corrected gestational age and mean body weight during interventions were: 1) VLBW: 28.80±2.3w and 31.68±3.2w, 1075,8±231gr and 1285,8±455 gr 2) LBW: 33.52±1.9w and 34.43±1.81w, 2040±403 gr 1959,42±374 gr. respectively with statistically significant difference between the weight categories p<0.001. Mean pain scores for the intervention stage and for the control stage were: 1) VLBW: 2.17±0.70 and 4.62±0.50 2) LBW: 1.54±0.58 and 4.38±0.50 3) full term: 1.54±0.58 and 4.38±0.50 respectively. Differences were statistically significant only for lowest score between VLBW and LBW, p=0.002. In all three categories, differences between lowest and highest scores were statistically significant (p=0.007; 0.010).

CONCLUSIONS: Based on the findings, highest pain scores were observed when neonates experienced iatrogenic pain without pain relief interventions in all three categories. Scores of neonates receiving pain relief methods were significantly lower. Developmental care interventions reduce pain, facilitate blood sampling and central line insertion. In addition, they are inexpensive, easy to use without adverse effects.

IMAGE / TAB:
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=62787e2a3c367f7e387cb4af0e635885-MjAxOS0wNSM1Y2UyNjJ2YmYzNjc2

IMAGE / TAB CAPTION: The pain scale used to assess stress and pain during the study period was the Swedish ALPS-Neo pain and stress assessment scale for newborn infants. During medical procedures, neonates clearly display well defined pain responses, so
five behaviours were

COI: None declared
ID: 211

TITLE: OXYGEN CYLINDERS DURING “ROOMING IN” - LEARNING FROM A SERIOUS ADVERSE INCIDENT

AUTHORS: Sonia Goyal 1
            Pinki Surana 2

AFFILIATIONS: 1. Department of Neonatology, Heartlands Hospital, University Hospitals Birmingham NHS Foundation Trust
            2. Department of Neonatology, Heartlands Hospital, University Hospitals Birmingham NHS Foundation Trust

CONTENT:
Many infants from neonatal units (NNU) are discharged on home-oxygen due to underlying respiratory or cardiac conditions. Home-oxygen is delivered via cylinders containing compressed oxygen. It is usual practice to train parents/carers in using the equipment and oxygen-therapy at home prior to discharge and offer “rooming-in” to build their confidence.

A recent ‘Patient Safety Alert’ by NHS Improvement highlighted the risk of death and severe harm from failure to obtain and continue flow from oxygen cylinders. We are reporting a Serious Untoward Incident where the incorrect operation of cylinder controls led to respiratory failure in a neonate.

A term baby was born with antenatally diagnosed skeletal dysplasia with a small chest. After initial support with non-invasive ventilation, the baby was stabilised on 0.2litre/minute of nasal-prong oxygen. A plan was made to discharge baby on home-oxygen and parents received training on home-oxygen therapy from the company providing the equipment. Parents were offered ‘rooming in’ NNU for one night prior to discharge. On the day of discharge, the baby was found pale and listless with low oxygen saturation. The baby needed full medical intervention including mechanical ventilation.

Following this serious adverse event, it was noted that the oxygen-cylinder in the room to deliver oxygen to the baby was full and the valve on the side was closed. On further scoping, it became evident that the cylinder was changed in the early hours of the morning by his father as the previous one was running out. The cylinder of the home-oxygen company had the open-close valve at the top, while the hospital oxygen cylinder had a knob-meter at the top but the open-close valve on the side. As dad was taught – he opened the top knob (unaware of the open-close valve at the side), turned the flow meter higher than needed to feel and hear the hissing airflow, and then reduced it to 0.2 litres/min. As the cylinders are pressurised, there is some release of gas for a minute or so when the top knob is turned on, but not subsequently. Dad told the nurse about the change of cylinder, who checked the flow-rate and the green pressure-gauge and was falsely reassured. Hence baby did not receive oxygen for 4 hours and deteriorated.

All users of oxygen-cylinders should be aware that
- Correct operation of the cylinder controls (typically opening the valve) is crucial to oxygen delivery.
- Green pressure-gauge indicator showing a full cylinder is not an indicator of active flow
- When the flow-rate dial is turned up of a cylinder with a closed valve, a ‘hissing’ sound can be there for a minute or so due to it being a pressurised canister

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 221

TITLE: MORTALITY OF FULL-TERM NEWBORNS IN A TERTIARY CARE HOSPITAL 1997-2017

AUTHORS: Dalia Stoniene 1,2, Paulina Aldakauskaite 2, Jolita Chomiciute 2, Inga Eidimtiene 2, Jelena Isakova 3, Egle Markuniene1, Rasa Tameliene 1,2.

AFFILIATIONS: 1 Lithuanian University of Health Sciences Kaunas Clinics, Lithuania
2 Lithuanian University of Health Sciences, Lithuania
3 Institute of Hygiene, Lithuania

CONTENT:
With the changes in the clinical practice and advance in diagnostics and treatment, mortality of pre-term and full-term newborns decreases. The mortality of full-term babies decreased from 1.7/1000 newborns in 1997 to 0.7/1000 newborns in 2017 in Lithuania.

The aim of this study is to analyse and compare mortality of full-term newborns in a tertiary care hospital Lithuanian University of Health Sciences Kaunas Clinics (LUHS KC) between 1997-2007 and between 2008-2017.

Retrospective analysis of case histories and medical certificates of death of full-term newborns, who died in the LUHS KC between 1997-2017. Data were processed using statistical package SPSS. The study was approved by the Institutional Bioethics Committee. Between 1997-2007, 31 937 neonates were born in the LUHS KC while between 2008-2017, 34 335 neonates were born. The mortality of full-term newborns between 1997-2007 was 2.81/1000, while between 2008-2017 it was 1.83/1000. In the period of 20 years 217 full-term newborns died, 118 (54.4%) of them were born in other hospitals. 142(65.4%) of them were born in a natural way, while 75(34.6%) by CS.

Full-term neonates who died 2008-2017 significantly more often were born by CS (28.3%/51.7%, p<0.001). 30.4% neonates died in less than 24 hours of age, 32.7% in 1-6 days, 30% in 7-27 days and 6.9% in more than 27 days. Congenital causes were responsible for 110(50.7%) of deaths, asphyxia/hypoxia for 40(18.4%), infection 18(8.3%), and meconium aspiration 11(5.1%). In 2008-2017 period deaths due to infections were significantly more often diagnosed (4.4%/19%, p=0.001) and significantly less congenital anomalies (57.2%/32.8%, p=0.001) were diagnosed during that period. The most common types of congenital anomalies were: cardiac malformations 110(50.7%), multiple anomalies 36(32.7%), CNS anomalies 14(12.7%), and chromosomal disorders 28(12.9%). While analyzing both periods, only chromosomal disorders were significantly more often diagnosed in 2008-2017 period (10.1%/20.7%, p=0.039).

The most common causes of full-term newborns’ death are: congenital anomalies, asphyxia/hypoxia and congenital infection. The comparative analysis of both periods 1997-2007 and 2008-2017 showed, that in 2008-2017 significantly less full-term newborns died, most of them were born by c/s, and the most common cause of death was congenital infection, not congenital anomaly.
ID: 227

TITLE: EPIDEMIOLOGICAL ANALYSIS OF THE DELIVERIES AND THE OUTCOME OF THE NEWBORNS IN OUR SUBURBAN HOSPITAL IN 2017-2018

AUTHORS: George Katsaras, Evlampia Tsentemidou, Anastasia Batsiou, Evaggelia Bechlivani, Konstantina Verikkokou, Anastasios Vladikas, Eleni Lazaridi, Evaggelos Oikonomou

AFFILIATIONS: Pediatric Department, General Hospital of Edessa, Edessa, Greece

CONTENT:
In developed countries 20% of deliveries take place in regional health units which do not have the necessary infrastructure or specialized personnel. As a result, often not up-to-date practices occur and an increased incidence of morbidity and transfer of neonates to NICUs is reported. What is more, according to literature, neonates that have been transferred from regional hospitals to NICUs have higher rates of severe morbidity and mortality in comparison with neonates that have been born in the same hospital to the NICU.

We conducted a retrospective analysis over a 2-year period (2017-2018) of all records of the deliveries that took place and of all files of the neonates which were born during that period. We recorded parameters such as gestational age, morbidity of the mother during pregnancy, type of delivery, type of anesthesia at cesarean sections, body weight at birth, need for resuscitation, respiratory support, need for transfer, morbidity and mortality of the neonates.

A total of 237 deliveries took place that period. 69,1% of the mothers were of Greek origin. Only 4 mothers had Diabetes Mellitus of pregnancy, 1 mother had hyperthyroidism and 8 mothers had hypothyroidism. Two thirds of the deliveries were cesarean section and only 13,7% of them was an urgent one. In only 4 cesarean sections was administered epidural anesthesia. The majority were term babies, 11,8% of them needed resuscitation. 27% of the newborns needed respiratory support and only 1 was intubated and transferred to an NICU. A total of 7 babies were transferred to an NICU. All babies that needed resuscitation or respiratory support were delivered by a cesarean section with general anesthesia but not of urgent cause. Neonatal jaundice was reported to 53,1% of the babies, but only 10% of them needed phototherapy. No perinatal infection or other morbidity was reported.

Although term babies have lower risk of resuscitation or respiratory support than preterm babies, cesarean section and general anesthesia are risk factors for these events compared to vaginal delivery or epidural anesthesia. Due to the fact that deliveries at regional health units are not few and because all newborns should receive standard care, continuous staff training, as well as cooperation with tertiary health care centers is necessary.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared.
ID: 230

TITLE: NEONATAL OUTCOMES OF EARLY TERM NEONATES IN COMPARISON WITH TERM NEONATES IN A REGIONAL HOSPITAL

AUTHORS: Evlampia Tsentemidou 1; George Katsaras 1; Anastasia Batsiou 1; Evridiki Vouloumanou 2; Georgia Ioannidou 3; Evaggelos Oikonomou 1

AFFILIATIONS: 1 Pediatric Department, General Hospital of Edessa, Edessa, Greece
2 Alfa Institute of Biomedical Sciences (AIBS), Marousi, Athens, Greece
3 Pediatric Department, General Hospital of Thessaloniki Papageorgiou, Thessaloniki, Greece

CONTENT:
Neonatal morbidity due to immaturity has been studied primarily in preterm neonates less than 37 weeks’ gestation. However, more recent evidence indicates that neonatal morbidity decreases with delivery at later gestational ages and babies with gestational age of 37-38 weeks are at increased risk for morbidity compared to newborns delivered at 39 week and have risks similar to those of late preterms.

This was a retrospective observational study of all neonates born from January 2017 to December 2018 in our Maternity Ward. Data and documentation files were analyzed according to gestational age, type of birth, type of anesthesia, birth weight, Apgar score, need for resuscitation or respiratory support, perinatal events and complications.

Our population consisted of 237 neonates, with a gender distribution nearly 1:1. Over two thirds were of Greek origin. Mean gestational age was 38.6 weeks, including 58% early term and 43.5% full term neonates. Only 4% were late preterms and 0.5% postterm. Mean birth weight was 3280gr. More than 60% of the deliveries were cesarean sections, mainly elective due to previous cesarean section or mother’s request, concerning early term babies in 89% and late preterms in 4% of them. Almost all cesarean sections were performed under general anesthesia. We found statistically significant correlation (P<0,001) between cesarean section and need for resuscitation, as well as higher correlation of early term neonates requiring resuscitation than late term neonates (P = 0,001). Gestational age appeared to have positive correlation with Apgar score at first and fifth minute of life (P<0,05).

The results of this study are in agreement with the current literature and our findings concerning the morbidity of early term neonates enhance the recommendation that elective cesarean section should not be performed before gestational age of 39 weeks.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 244
TITLE: test
AUTHORS: test
AFFILIATIONS: test

CONTENT:
test
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IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: test
ID: 254

TITLE: HEMOLYTIC CAUSED BY MULTIPLE MINOR BLOOD INCOMPATIBILITIES IN A NEWBORN

AUTHORS: Ali Ulas Tugcu 1; Deniz Anuk Ince 1; Ozden Turan 1, Burcu Belen 2, Lale Olcay 2, Ayse Ecevit 1

AFFILIATIONS: 1 Paediatric Dept., University Hospital of Baskent, Division of Neonatology, Ankara, Turkey
2 Paediatric Dept., University Hospital of Baskent, Division of Neonatology, Division of Pediatric Hematology, Ankara, Turkey

CONTENT:
Hyperbilirubinemia is one of the most widely seen cause of neonatal morbidity. Besides ABO and Rh isoimmunization, minor blood incompatibilities have also been identified as the other causes of severe newborn jaundice. We report a newborn with indirect hyperbilirubinemia caused by multiple minor blood group incompatibilities (P1,M,N, s and Duffy) and was treated successfully with phototherapy and intravenous immunoglobulin therapy.

A thirty-two gestational weeks of preterm male baby weighing 1815 gr was born with cesarean section to 32 year old mother and was transferred to the neonatal intensive care unit. On postnatal (PN) day 4, total bilirubin was detected as 10.8 mg/dl then the bilirubin level increased to 14.6 mg/dl on PN day 5 (direct bilirubin: 0.76 mg/dl). The mother’s blood group was O Rh(+) and the baby’s blood group was O Rh(-). Complete blood count (CBC) revealed a hemoglobin (Hb) of 15.4 gr/dl and hematocrit of 46% and reticulocyte was 1.6%. Liver function tests (LFT) were normal and direct coombs test was negative. There were no signs of hemolysis at the peripheral smear. Phototherapy was initiated. He became severely icteric on postnatal day 11, with a total bilirubin level of 14.66 mg/dl, reticulocyte level of 8.7 % and liver function tests were normal. Antibody screening tests revealed incompatibility on multiple minor groups (P1, M, N, s and Duffy (Fya ve Fyb)). On postnatal day thirteen, the level of bilirubin increased to 20.66 mg/dl although baby was under intensive phototherapy. Intravenous immunoglobulin was given. On follow-up blood exchange was not performed. Hb value is increased and the value of bilirubin level decreased to 9 mg / dl. The baby was discharged with full recovery on postnatal day 31.

In recent years, minor sub-blood group incompatibilities have been seen mostly as the cause of pathological jaundice. The diagnosis and treatment process of hemolytic jaundice may be delayed due to the lack of specific immunoglobulin and also minor sub-blood group incompatibilities is not considered firstly in the differential diagnosis. This case is presented because of the rarity of multiple minor blood groups in the newborn.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 259

TITLE: THE EFFECTS OF PRETERM BIRTH ON PARENTS’ PSYCHOLOGICAL WELLBEING AND WORK

AUTHORS: Dr Laura M.L. Dix 1; Drs Michelle J.D. Vullings 2; Dr Gerdien A. Tramper 1; Drs Angelique K.E. Hoffmann-Haringsma 1.

AFFILIATIONS: 1 Francisca Gasthuis & Vlietland, Rotterdam, The Netherlands
2 Utrecht University, Utrecht, The Netherlands.

CONTENT:
Preterm birth can be a stressful and traumatic event for both the infant and the parents. The concern for the infant’s health and safety, often combined with a prolonged hospital stay can be psychologically straining for parents. Additionally, parents also report problems concerning work, medical health and relationship issues within the family following preterm birth. These problems coincide with high societal expenses, for instance due to reduced work productivity or unemployment. The aim of this study is to compare mothers of prematurely born infants and mothers of term born infants on their psychological well-being and work productivity in the first 2 years after childbirth.

In this pilot study 60 term and 60 preterm infants were randomly selected (with ExcelRand) from all infants born between 2016 and 2017 at the Francisca Gasthuis Rotterdam. Parents were approached by letter and phone. All term infants had an indication for observation (e.g. risk of infection, birth weight, etc). The questionnaire could be filled out online or at “Het Kleine Heldenhuı̀s” (an outpatient follow up clinic). The questionnaire included these (separately validated) questionnaires; Edinburgh Postnatal/Postpartum Depression Scale, 4 Dimensionale Klachtenlijst, Productivity Cost Questionnaire, Care-related Quality of Life instrument, Medical Consumption Questionnaire and re-hospitalization of the infant.

A total of 26/60 mothers of preterm infants and 30/60 mothers of term infants responded. Mean age of infants was 14 months in both groups. Mothers of preterm infants reported a significantly higher rate of depressive symptoms compared to mothers of term infants. A sub-analysis of mothers of preterm infants showed that a higher incidence of depressive symptoms was significantly associated with an increased medical consumption, indicating consultation of different health care providers. No significant differences were found in anxiety, stress, social support, financial problems, loss of work productivity, absence from work, medical consumption and re-hospitalization of the infant between mothers of term and preterm infants.

Mothers of preterm infants are more likely to experience psychological symptoms following childbirth, and these appear to be related to medical consumption. Psychological support for parents of preterm infants after birth might contribute to reduce psychological symptoms, and should be studied in a prospective study design.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: none declared
ID: 261

TITLE: Monitoring of fetal lung volume with MRI and prediction of perinatal outcome in 3 cases of periviable PROM

AUTHORS: E. Portinaro 1; R. Romoli 2; P. Faldini 3; M.C. Laguardia 4; V. Chierici 5; G. Ciraci 6; L. Iantorno 7; S. Fiocchi 8; R. Conturso 9; D. Arduini 10; D. Merazzi 11

AFFILIATIONS: Neonatal Department, Valduce Hospital, Como, Italy
Obstetric and Gynecology Department, Valduce Hospital, Como, Italy
University of Tor Vergata, Rome, Italy

CONTENT:
Lung development has two phases: a) Branching morphogenesis with fetal respiratory movements, stretching on the airways and peristalsis of the pulmonary fluid and b) the alveolar phase with formation of the alveolar-capillary barrier. Premature rupture of the membranes (pPROM) in periviable age (EG ≤ 24w) and the related oligoamnios interfere with these processes favoring pulmonary hypoplasia. Currently, a predictive ultrasound parameter for pulmonary hypoplasia is not available. Fetal MRI with the calculation of the fetal lung volume compared to the lung volume expected for EG could be a valid aid in assessing lung growth and directing to customized counseling.

We studied 3 newborns with pPROM at periviable age: 19 + 1w (a), 24 + 2w (b) and 20 + 6w (c).
A conservative obstetric attitude was established with serial ultrasound checks for the evaluation of oligoamnios and fetal well-being through the clinical and biochemical signs of chorioamnionitis. In all cases a complete steroid prophylaxis was performed at 24 w.
The mothers were subjected to fetal MRI without sedation with T2-weighted sequences, section thickness of 3-4 mm spaced 0.3-0.4 mm during maternal breath-hold to minimize artifacts. Lung volume was calculated by multiplying the lung area of each slice by the interslice distance, and the sum of all sections and for each MRI calculated the percentage of expected lung volume. A 2nd MRI has been programmed, where possible after 4 weeks.

Case (a) MRI at 26 + 1w: lung volume (lv) of 13.6 cm³ = 47.5% expected volume (ev) (28.6 cm³). 2nd MRI at 31 + 3w with lv of 24.7 cm³ = 48.5% ev (50.9 cm³). Vaginal delivery at 34 + 1w, interval pPROM-birth 105 days. At birth, mild respiratory distress treated with nCPAP and O2 for 24 h. Discharged after 22 days at 37 + 2w PMA. Case (b) MRI at 27 + 4w lv of 16.1 cm³ = 47.9% ev (33.6 cm³). C-section at 29 + 1w for maternal infection. pPROM-birth: 34 days. At birth unresponsive pulmonary hypertension and exitus at 48 h. Case (c) MRI at 24 + 6w lv of 14.2 cm³ = 57.4% ev (24.9 cm³). 2nd MRI at 28 + 5w with lv of 36.1 cm³ = 94.8% ev (38.1 cm³). C-S at 32 + 4w for oligoamnios. pPROM-birth: 82 days. At birth moderate respiratory distress treated with nCPAP for 9 days and O2 therapy for 48. Discharged after 30 days at 36 + 6w PMA. In every case placental histology showed acute chorioamnionitis.

pPROM in periviable age is associated with oligoamnios and pulmonary hypoplasia.
The choice of active or conservative management can benefit from fetal MRI with the calculation of the ratio between the measured lung volume and the expected one. MRI may also provide additional information with respect to pulmonary ultrasound: a) Fetal pulmonary volume; b) State of maturation of the fetal lung; c) Structure of the fetal lung.

IMAGE / TAB: https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=d6a1f1e6a4e9418c3ee1f13cd3730b4a-MjAxOS0wNSM1Y2UyNjY2YzEyNWJl

IMAGE / TAB CAPTION:

COI: no conflict of interest to declare
ID: 267

TITLE: Learning Points from Positive Outcome of Abdominal Pregnancy

AUTHORS: Yograj Deorukhkar 1; Ellen Brogan 2; Anjum Deorukhkar 3

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CONTENT:

Extra-uterine (abdominal) pregnancy with live and healthy new born outcome is extremely uncommon, as it invariably is associated with high risk of fetal and maternal morbidity and mortality. It can be difficult to identify antenatally, and yet planning for surgical delivery of these infants is important in pre-empting and reducing maternal and fetal risk. Reports in the literature of advanced pregnancy with positive outcome are especially rare. Live-born neonates of abdominal pregnancy are at risk of complications including intra-uterine growth restriction, pulmonary hypoplasia, congenital malformations, limb deformities, joint abnormalities, craniofacial abnormalities, and CNS defects. We present a case of abdominal pregnancy diagnosed at delivery and subsequent neonatal course.

A G2P1 woman known from first pregnancy to have a bicornuate uterus was diagnosed with oligohydramnios at 19/20 routine US scan and received consultant-led obstetric care. A neonatal alert was raised for anhydramnios from 20 weeks, bicornuate uterus and low estimated foetal weight. The infant was delivered by elective caesarean section at 32 weeks following steroid administration due to further maternal concerns. Delivery was complicated by acute severe maternal blood loss secondary to placental implantation onto bowel loops needing multiple blood transfusions for mother. The infant had an initially difficult neonatal course requiring intensive care for Persistent Pulmonary Hypertension of New born needing high frequency oscillation ventilation and use of Nitric oxide therapy. Other findings at birth included significantly abnormal moulding with plagiocephaly, bilateral congenital talipes and dislocated hip joints. He went on to get successfully extubated onto CPAP in the first week. Subsequent course on low dependency was relatively uncomplicated. He made an excellent recovery with no adverse neurological outcomes and did not need ongoing respiratory support when he was discharged home at day 18.

Follow up and continuing care has centred around congenital hip dislocation and craniofacial abnormalities. Supra regional referral to craniofacial team was made after cranial imaging which ruled out craniosynostosis during the MDT meeting. He is currently managed conservatively with regional specialist physiotherapy support. Ophthalmological and ENT assessment was normal. The infant is currently thriving and developing appropriately for age.

Extra-uterine pregnancy: pulmonary hypoplasia, congenital hip and joint disorders, and abnormal moulding with craniofacial dysostosis. Delivery recommended in maternity hospitals with tertiary care unit. Follow up with specialist multidisciplinary therapy approach is essential. Bicornuate Uterus: Diagnosis at later gestation can be difficult. General surgical presence and implementation of a major haemorrhage protocol may be essential at delivery.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 269

TITLE: Placental Transfusion of pre-term babies (≤32 weeks) at birth: A Neonatal Network Quality Improvement Project with a pilot in a level 3 neonatal centre

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CONTENT:
Delayed cord clamping (DCC) or umbilical cord milking (UCM) as part of a placental transfusion (PT) practice reduces mortality by 27% in pre-term babies. Despite available evidence of the benefits of DCC/UCM in pre-term babies, it is not consistently practised. A change of practice requires involvement of a multidisciplinary team, a clear protocol, ongoing education and a dynamic feedback system. The Neonatal Network in the South East of England conducted a quality improvement project (QIP) to improve uptake of DCC/UCM.

The QIP model followed the ‘Plan Do Study Act’ (PDSA) cycle method to enable the stepwise introduction of the practice and documentation of DCC/UCM in preterm babies ≤32 weeks. As preparation a network questionnaire was sent out to assess current knowledge and practice in all 13 neonatal network units. An educational program was developed with visual aids, presentations and dynamic Q&A rounds and rolled out to 6 perinatal network teams.

A pilot was run in a local University teaching hospital’s units (intensive care level 3 and a level 1 unit) with established practice of DCC/UCM. Retrospective data pre-QIP was compared to prospective data during QIP cycle. Data was analysed using Excel.

After the local pilot an online audit tool kit was created to enable all units to perform the QIP.

11 out of the 13 neonatal units in the Neonatal Network responded to the questionnaire. Knowledge of DCC in term babies was good but knowledge and practice of UCM in pre-term babies was considered lacking. The questionnaire demonstrated a need for a neonatal network agreed upon guideline and education of the use of UCM.

Through a series of educational presentations, Q&A rounds in regional neonatal units and online available tools on placental transfusion, 4 units have agreed to commence an audit.

In the two local neonatal units, documentation of UCM on electronic patient records improved from 30% (38 out of 62 neonates) to 90% (26 out of 29 neonates) of all pre-term neonates ≤32 weeks.

A change of practice can be successfully instigated by using the PDSA-cycle, ensuring a dynamic process of feedback integration to keep the practice relevant and applicable. The involvement of a multidisciplinary team and a central protocol underpinned by consensus is a crucial aspect to its successful adoption. The PDSA cycle is an ongoing process and this study will be ongoing with integration of other unit’s audit results.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: none declared
ID: 279
TITLE: NEONATAL COMPLICATIONS IN PRETERM DISCORDANT TWINS
AUTHORS: S. Cvetkova, D. Yordanova, E. Kovachev, MD,
AFFILIATIONS: Bulgaria, , Varna, Medical University, Hospital of Obstetric and Gynecology

CONTENT:
Multiple births have increased over the past two decades. In addition to prematurity and low birth weight (LBW), twin pregnancies are also complicated with discordant growth; which has been reported to be associated with increased neonatal morbidity and mortality.
The incidence of discordant twins varies between 10% and 30% according to the cutoff value used to describe discordance.
The lack of a standard definition for a clinically significant growth difference within a twin pair is partly a result of conflicting data on the associated adverse perinatal outcomes.

A retrospective study of preterm twins, followed in NICU of Hospital of Obstetric and Gynecology, Medical University Varna, from 01. January 2015 to 31. December 2018. 110 sets of preterm twins (220 infants) were included in the study.
Twins were classified as discordant when the difference in birth weight was >15%. Discordance was determined by the formula:
\[(\text{birth weight of larger twin} - \text{birth weight of smaller twin}) / \text{birth weight of larger twin} \times 100\].

Short-term outcome measures of specific neonatal morbidities included asphyxia (Apgar score <7 at 5min.) respiratory distress syndrome, infection, severe intraventricular hemorrhage (IVH, grade 3 or 4), congenital anomalies, mortality. Other data points analyzed included birth weight, gestational age, gender, mode of delivery.

Results: Birthweight discordance is an important indicator of complications that affect intrauterine growth in one of the twins, and usually cause the birth of a SGA infant. Significant statistical association between pair discordance and IUGR in one of the twins is found. The high discordance is associated to the presence of one SGA twin, with the other AGA or LGA.
The smaller twin show more often low Apgar score, congenital anomalies, intraventricular hemorrhage higher risk of mortality.

Conclusion: Incidence and outcome of discordant twins were assessed based on birth weight difference more than 20 %, related with VLBW and VLGA. Discordant growth is a risk factor for prolonged hospitalization. The mortality rate did not differ between concordant and discordant groups.

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COI: None declared
ID: 284
TITLE: THE RECOGNITION AND CLASSIFICATION OF EAR DEFORMITIES IN NEWBORN INFANTS
AUTHORS: Deniz Anuk Ince 1, Ayse Ecevit 1, Özden Turan 1, Ali Ulas Tugcu 1, Ali Haydar Turan 1, Hazel Delal Dara 1, Aylin Tarcan 2
AFFILIATIONS: 1 Paediatric Dept., University Hospital of Baskent, Ankara, Turkey
2 Paeditaric Dept., Hospital of Losante Children and Adult, Ankara, Turkey

CONTENT:
Congenital ear deformities are common in newborn infants and 15 to 20 percent of newborns presenting with misshapen ears that do not self-correct. In the recent years, ear deformities are permanently and completely corrected with a noninvasive method in the first weeks of life before the stiffness of the cartilage. During the first few days of life, the auricular cartilage has an unusual plasticity due to maternal circulating estrogens and return baseline levels during the week 6. In this study, we aimed to determine and classify the ear deformities in the newborn infants.

In this prospective study, 92 newborn infants born in our hospital were evaluated and ear deformities were classified into eight groups. The following ear deformities were Stahl’s ear, helical rim deformity, lidding, cup ear, prominent ear, conchal krus, cryptotia and mixed type. Ear shapes were evaluated by two different clinicians.

In this study, 92 newborn babies and 184 ears were evaluated in the first 24 hours of life. The mean gestational age of the infants was 37.7 ± 1.3 weeks, and the mean birth weight was 3020.8 ± 600 grams. 44.6% (41/92) of the babies had ear deformity, and 29.3% of these babies had bilateral ear deformities. The following ear deformities were 15.2% lidding, 8.7% mixed deformity, 7.6% Stahl’s ear, 6.5% helical rim deformity, 3.3% conchal krus, 1.1% cup ear, 1.1% prominent ear and 1.1% cryptotia.

Congenital ear deformities can be corrected with a noninvasive method in the first weeks of life and reduces the need of surgical correction. Children with ear deformities usually have more psychological distress, anxiety and behavioral problems than the infants with normally shaped ears. The early recognition of the ear deformities is important for referring the affected infants for the treatment in the first weeks of life.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 306
TITLE: Diaphragmatic Eventration in Neonates - Early operativ treatmant
AUTHORS: Shpresa Sylejmani 1; Ardian Shefkiu 2; Xhevdet Gojnovci 3; Miradije Hiseni 4;
AFFILIATIONS: Neonatology Department
Pediatric Surgery Department
University Clinical Centre of Kosovo

CONTENT:
Background: Diaphragmatic eventration in neonate is the abnormal elevation of the diaphragm as a result of paralysis, aplasia or atrophy of the muscular fibres. It may compress ipsilateral lung, recurrent pneumonia due to atelectasis with respiratory distress and respiratory failure, prolonged mechanical ventilation and failure to extubation. The incidence is about 1 per 10000 live births. Asymptomatic diaphragmatic eventration may be late diagnosed and for long time are treated conservatively. From 2014 – 2019 we have 5 full term neonatal cases (4 cases with presentation and 1 case with breech presentation): 2 cases with long respiratory assistance (CPAP, MV, NSIMV, Hood) and respiratory problems, 1 case with DE left side and GER, 1 case with O2Hood for 6 weeks and last case with short respiratory assistance due to early diagnostication and operation.

Case Presentation: Female newborn with spontaneous delivery, breech presentation, 38 weeks gestation SGA. Third gravidity and parity, weight 1800 gr, length 48 cm with Apgar score 5/6. Findings from physical examination: facial dysmorphic signs, syndactyis dig II/III pedis lat. dex. respiratory distress in nasal CPAP, neonatal course was complicated after 20 h and put in SIMV. The chest X-ray and fluoroscopic examinations revealed eventration of diaphragm on right side. After recurrent extubation second time with failure and respiratory alkalosis, after 18 days of life made surgical plikation. After 2 days of operation was extubated. Repeated chest radiograph with normal diaphragm and good mobility. Baby is in good condition with breastfeeding and without respiratory signs with weight 2135 gr. in discharge.

Conclusion: Early surgical intervention for the first time in our neonatal case resulted in rapid improvement and weaning from ventilator, reduce respiratory assistance, pulmonary infection, and other potential complication and hospitalisation. De Vries et al. recommend to do the operation at the end of month. Researchers have recommended that symptomatic patients should be operated in 3 – 6 weeks if the neonate cannot be weaned from ventilation.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 309

TITLE: Early diagnosis of Noonan syndrome with PTPN11 mutation

AUTHORS: Schönfeld Mascha 1, Winter Jennifer2, Selig Mareike2, Lindner Christine3, Kampmann Christoph1, Engel V4, Mildenberger Eva1, Whybra Catharina1

AFFILIATIONS: 1Department of Pediatrics, 2Institute of Human Genetics, 3Clinic for Obstetrics and Women’s Health and 4Department of Pediatric Surgery, University Medical Center of the Johannes Gutenberg University Mainz, Germany

CONTENT:
Non-immune hydrops fetalis (NIHF) is still a challenging diagnosis. The success of identifying a cause depends on the thoroughness of efforts to establish a diagnosis. Therefore, we developed a genetic panel for early diagnosis of NIHF (“hydrops panel”). We report on the application of this tool in a premature female patient delivered via emergency cesarean at 30 + 1 weeks of gestational age due to rapidly developing NIHF to a healthy mother. In former prenatal screenings there was the suspicion of a congenital cardiac defect but no signs of increased nuchal translucency, polyhydramnion or short femur, otherwise typical for Noonan syndrome.

The patient was born with NIHF, hypovolemic shock, severe anemia (hemoglobin 7.7g/dl), severe thrombocytopenia (8/nl) and disseminated intravascular coagulation. At immediate drainage of both pleural and the peritoneal cavities, bloody effusions were observed. After stabilization with fluid and catecholamine rescue, the patient was transferred to our NICU. Physical examination revealed muscular hypotonia and a distinct short and webbed neck. One sided brain infarction and bilateral intraventricular hemorrhage grade II was detected on ultrasound. Echocardiography confirmed a double-outlet right ventricle in combination with an atrial septum defect. During the first few weeks the infant was mechanically ventilated and had bilateral chest tube drainage for chylothoraces. Genetic testing by the “hydrops panel” detected a de novo gain of function in exon 3 of the PTPN11 gene (c.218C>T; p.Thr73Ile).

A permanent cessation of ventilation was not possible because of cardiac and pulmonary issues. The patient developed a consecutive (sub-)ileus. A laparoscopy revealed a giant Meckel’s diverticulum. A stenosis could not be approved. In this session, a Micro-Port implantation was accomplished.

Since birth, recurrent thrombocytopenia was detected and lead to frequent platelet transfusions.

Although a variety of prenatal presentations of Noonan syndrome and NIHF have been reported, this is the first description of NIHF in Noonan syndrome due to the mutation identified in our patient. Cases reported with this particular mutation mainly do have a heart defect; all reveal thrombocytopenia and few juvenile myelomonocytic leukemia. The application of the “hydrops panel” facilitated the early specific diagnosis of this case.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 316

TITLE: New Psychoactive Substances and their use in pregnancy: neonatal effects

AUTHORS: Rachel Toone 1; Kathryn Johnson 2

AFFILIATIONS: Leeds Neonatal Service, Leeds Children’s Hospital, Leeds General Infirmary

CONTENT:
Pattern of drug use in pregnancy is changing, as a result the presentation and management of classical NAS may need to be reviewed.
New Psychoactive Substances (NPS) is now the accepted term for what used to be called ‘legal highs’.
Imported mainly from Asia, NPS have become increasingly prevalent in the UK. Despite the Psychoactive Substances Act in 2016, which banned the production, supply and importation of any psychoactive substances for human consumption, their use has continued to increase

We present 2 cases from our large tertiary neonatal unit.
The first case, the mother, of no fixed address had a history of complex drug use including opiates, cocaine, cannabis, pregabalin and spice. The baby was born at 37 weeks with a birth weight of 2.2kg. The baby presented with complex neurological symptoms and feeding issues.
In our second case, the mother was of no fixed address and had a history of polydrug use including spice during the early stages of pregnancy but denied any recreational drug use during the latter months of pregnancy. The baby was observed but showed no symptoms of NAS.
In both we will describe their course and outcome along with our literature review describing and highlighting the potential teratogenic and withdrawal effects of these new substances.

There is a great deal of literature over recent decades covering “classic” Neonatal Abstinence Syndrome. Literature regarding NPS and withdrawal is sparse. The NPS can be divided into 5 groups: Stimulants (similar in effect to cocaine), ‘Downers’ (similar to benzodiazepines), Hallucinogens (similar to LSD), Dissociatives (similar to ketamine), Synthetic cannabinoids.
Synthetic cannabinoids are probably the most widely available of these substances and as a result there is greater literature on their potential effects. However the effects of the different product groups are not distinct, particularly in the context of polydrug use.
Our 2 cases highlight the variety of clinical presentation and the unpredictability of withdrawal symptoms from such substances

Patterns of drug use and misuse are changing in the UK and Europe. As a result management of such infants may need to change/evolve to meet their specific needs.
Clinicians need to be aware of the “new drugs on the block”, how to manage the resulting withdrawal and any potential long term consequences on exposed infants.

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COI: None declared
ID: 325

TITLE: STAFF EVALUATION OF A MULTIDISCIPLINARY DECISION MAKING TOOL FOR ELECTIVE EXTUBATION IN EXTREMELY PRETERM INFANTS IN A TERTIARY NEONATAL UNIT

AUTHORS: Olubunmi Akinnawonu1; Vimal Vasu 2

AFFILIATIONS: Neonatal Dept, William Harvey Hospital, Ashford, Kent United Kingdom

CONTENT:
We have previously shown a reduction in the rate of elective extubation failure rates in extremely preterm infants, following implementation of a multidisciplinary decision making tool (DMT as shown in figure two) from 40.9% to 25% (as shown in figure one). This was presented as a poster at the Annual Conference and Scientific meeting of the British Association of Perinatal medicine (BAPM) on 27th to 28th September 2018 (as shown in figure three). Here we present data on neonatal staff evaluation of the use of the DMT to determine the feasibility of its use in day to day clinical practice and its perceived utility.

Staff views were sought using an electronic questionnaire (SurveyMonkey™) between 29th June 2018 and 7th July 2018, following implementation of the elective extubation DMT. In the questionnaire which was sent via email to both the nursing and medical staff on the neonatal unit, a total of eight questions were asked including their role, whether they found the tool useful, easy to use or would recommend its use for future planned extubation etc. The website (SurveyMonkey) analysed the result and the identity of the respondents were protected.

A total of thirty one people responded, out of which about 48% were medical staff another 48% were nursing staff and about 4% responded as neither (four were consultants, 11 were junior doctors and the rest nurses). The analysis of responses from the staff suggests that majority of the staff found the DMT useful, easy to use and would recommend it for use in future extubations of extreme preterm infants. About 80% found it either extremely useful or very useful, 90% either strongly approve or approve it inclusion as part of our standard clinical practice, and more than 90% found it easy to use.

The decision making tool for extubation for extremely preterm infants is very easy to use and may be successfully adopted for use on the neonatal unit. From the response from the staff on the neonatal unit, both the doctors and the nurses found it very useful and it can create collaboration between the nursing and the medical staff in the extubation of these infants.

IMAGE / TAB:
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=768fa24e69c28114604b82e6b2b9-MjAxOS0wNSM1Y2UyNjY2YzJlYzI3

IMAGE / TAB CAPTION: Figure one: Graph demonstrating a reduction in extubation failure rate between baseline and intervention groups. Figure two: Decision making tool for extubation in extreme preterm infants. Figure three: Poster presented at the BAPM conference in September

COI: NONE DECLARED
ID: 329
TITLE: IMPACT OF VENTILATOR-ASSOCIATED PNEUMONIA ON THE NEED FOR HOME OXYGEN THERAPY
AUTHORS: Yuki Nakata ; Makoto Tamura ; Miwako Nagasaka ; Yoshinori Katayama
AFFILIATIONS: Department of Pediatrics., Takatsuki General Hospital, Osaka, Japan

CONTENT:
Ventilator-associated pneumonia (VAP) is a common nosocomial infection related to mechanical ventilation (MV) in critically ill neonates. Several studies reported that VAP was associated with a longer duration of MV and hospitalization among neonatal intensive care unit patients. However, the patients with VAP were more premature in gestational age (GA) and birth weight compared to the patients without VAP in most of those studies. There have been few studies that investigate the outcomes of VAP focused only on premature infants. To date, no reports have described the influence of VAP occurrence on the need for home oxygen therapy.

The objective of this study was to investigate the impact of VAP occurrence on outcomes including the need for home oxygen therapy in preterm infants born between 22 and 25 weeks GA. We conducted a retrospective cohort study of 106 preterm infants (≤25 weeks GA) born at our hospital between January 2010 and December 2017. Baseline characteristics were compared between 67 cases of infants with VAP and 39 controls using a chi-square test, or Mann–Whitney U-test. VAP was diagnosed using published criteria for preterm infants including gram staining and clinical signs (J Perinatol, 2009). Duration of MV and hospitalization, rate of bronchopulmonary dysplasia (BPD) at 36 weeks postmenstrual age, and proportion of need for home oxygen therapy were compared as outcomes between these two groups.

Mean (SD) GA and birth weight (BW) for our study population were 23.7(1.0) weeks and 610 (135) g, respectively. No significant differences were noted between the groups depending on GA, BW, male gender, Apgar score, small-for-gestational-age, antenatal steroids, or histological chorioamnionitis. Duration of MV (median 60 days vs. 55 days) and hospitalization (median 154 days vs. 154 days), and rate of BPD (90% vs. 92%) were comparable between infants with VAP and controls. However, infants with VAP had a significantly higher proportion of need for home oxygen therapy than control infants (28% vs. 8%, p = 0.01). A univariate logistic regression analysis revealed that VAP was a significant predictor of the need for home oxygen therapy with an odds ratio of 4.8 (95% confidence interval [CI], 1.3–17.3; p = 0.02).

Our results suggest that VAP occurrence is associated with an increased risk of need for home oxygen therapy in preterm infants born at <26 weeks gestation.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 352

TITLE: INTRAOSSEOUS INFUSION OF ACYCLOVIR

AUTHORS: Rosa Lapolla 1, Luciana Romaniello 1, Saverio De Marca 1, Giulio Strangio 1, Simona Pesce 1, Giuseppe Adorno 2, Giorgio Madonna 1, Giambattista Gallicchio 1, Camilla Gizzi 1

AFFILIATIONS: 1 Department of Neonatology and NICU – “San Carlo” Hospital, Potenza, Italy
2 Department of Cardioanesthesia and Cardiology Resuscitation – “San Carlo” Hospital, Potenza, Italy.

CONTENT:
Intraosseous (IO) access offers a fast method for fluids and drugs administration when intravenous access fails in infants. Several medications can be administered via the IO route, however few information are available regarding IO administration of antiviral agents. Suggested neonatal IO insertion site is the proximal tibia and distal tibia. The IO needle may remain in place for up to 30 hours. Complications in infants are reported as <1%. Literature data shows that uncomplicated IO route has no lasting negative effects on the bone, growth plates and marrow elements. The following report describes the case of a 2 weeks old infant who received acyclovir through IO access.

A 12 days old, female term infant, AGA, was admitted to our UNIT for feeding problems, fever and lethargy. She was born by vaginal delivery after an uneventful pregnancy. Maternal swabs were positive for group B streptococcus (GBS) and a complete ampicillin course was administered before delivery. Clinical history from birth to admission was unremarkable. Upon arrival to the UNIT, a physical examination revealed a lethargic, hyporeactive and poor perfused infant with a slightly bulging bregmatic fontanel. The initial blood analysis revealed increased C-reactive Protein; haemoglobin, total leukocyte count, serum electrolytes, renal and liver function tests within normal limits. The lumbar puncture resulted in clear cerebrospinal fluid (CSF) leakage with 1916 leucocytes/mm3. Glucose level in CSF was reduced while proteins were increased. Blood and CSF specimens were examined for common bacterial pathogens and viral pathogens of central nervous system. A peripheral intravenous access was obtained through which empiric antibiotic (Ampicillin, Netilmicin and Ceftazidime) and antiviral (Acyclovir) therapy was administered as hourly intravenous (IV) infusions. The infant also received fluid therapy. Unfortunately, 20 hours later her venous access was lost and a new one could not be obtained, due to vessel fragility. Considering the urgent need to timely and effectively perform the therapy, an IO line was then placed in the patient’s proximal right tibia by means of an orthopedic drill. The IO access was kept in place for 8 hours, until a femoral vein cannulation was established. The infant received through the IO access a single dose of ampicillin, ceftazidime and acyclovir. While the IO access was in place, the infant’s extremity was regularly checked for swelling, extravasation or altered circulation. Cultural investigations revealed GBS meningitis. She was managed accordingly and discharged 25 days later. The infant has been regularly followed up until the age of 8 months. During and after the IO acyclovir administration no complications were noticed in our patient.

IO infusion is not widely used in the neonatal population, but is a viable option when IV access cannot be established. The literature regarding the safety and effectiveness of IO acyclovir in neonates is scarce. Our case is limited to a single dose of IO acyclovir administration with no adverse effects reported throughout an8-months follow up. Further clinical studies are needed to confirm the safety and efficacy of acyclovir through this route.

IMAGE / TAB:

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COI: None declared.
ID: 364

TITLE: BIRTH PREVALENCE AND NATURAL HISTORY OF HEART MURMURS IN NEWBORNS >= 35 WEEKS’ GESTATION – SINGLE CENTRE STUDY OVER A 2-YEAR PERIOD (2017-18)

AUTHORS: Zainabu Mudasiru 1; Avinash Jinadatha 2; Ose Dibua 3; Sankara Narayanan 4

AFFILIATIONS: 1, 2, 3 & 4: Department of Paediatrics and Neonatology, Watford General Hospital, Watford, United Kingdom

CONTENT:

Heart murmurs are a common during newborn period with a reported prevalence of 0.9 to 77 % during early neonatal period. It can be a source of parental/clinician anxiety and in some cases a sign of congenital heart disease (CHD). Aim of our study was to determine birth prevalence of heart murmurs in neonates >= 35 weeks at our centre and follow through its natural progression in the newborn period, 6 week examination and first year of life.

Local Newborn and Infant Physical Examination (NIPE) database was interrogated retrospectively to identify neonates >=35 weeks with risk factors for CHD (heart murmur, family history of CHD, and/or abnormal clinical signs) born over 2 year period (2017-18). This data was cross-referenced with hospital episode statistics for ICD-10 codes P29.8, R01.0-1.2. Clinical course of neonate with heart murmur was tracked through newborn period till final cardiac outcome was known. Outcomes were described as 1) Spontaneous murmur resolution 2) Diagnosis of CHD (2a. Physiologic shunt, 2b. Moderate to severe CHD 2c. CHD requiring surgery, 2d. CHD related death). Study was registered with local clinical audit department. Appropriate descriptive and inferential statistics were used to analyse data.

8929 neonates >=35 weeks were born during study period and complete data was available for 8874 neonates (99.4%). CHD risk was present in 331 (3.7%) infants that included positive family history. Murmurs as an isolated risk factor was present in 295 (3.3%) neonates.

In 29 of these newborns murmur was defined as pathological and echocardiogram performed before discharge. 7/29(24%) had a diagnosis of moderate to severe CHD. In 266/295(90%) murmur was non-pathological and 188 (70%) spontaneously resolved by 6 weeks of age. The other 78 infants were referred for echocardiogram and 26 (10%) had moderate to severe CHD.

Moderate to severe CHD in the entire murmur cohort was 33/295 (11%), 7/29 (24%) for pathological murmurs and 26/266 (10%) for non-pathological murmurs. 4 infants required surgery < 1-year of age and none died. All the findings and clinical progression summarized in Figure 1.

Our data shows birth prevalence of heart murmurs to be 3.3 % which is higher than previous reports from United Kingdom. Majority of infants were well and 70% of murmurs spontaneously resolved by 6 weeks of age. Moderate to severe CHD was present in 11 % of infants with a heart murmur detected in early newborn period and 1.3% required surgery <1 year of life. Our data justifies referral for echocardiogram if murmur persists beyond 6 weeks of life.

IMAGE / TAB: https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=68687f5025dcdbff43d2a1713809e0c7-MjAxOS0wNS0xMjI1Y2UyNyYzNyMjMWM4

IMAGE / TAB CAPTION: Figure 1: Outcome of heart murmurs detected in newborn examination

COI: none declared
ID: 369

**TITLE:** OUTCOMES IN NEONATES WITH CONGENITAL CARDIAC DISORDERS ADMITTED TO A NON-CARDIAC NEONATAL INTENSIVE CARE UNIT: A FIVE YEAR REVIEW

**AUTHORS:** Aarti Verma; Ayanda Madide; Ghada Ramadan; Santodh Pattnayak

**AFFILIATIONS:** Oliver Fisher Neonatal Unit, Medway Maritime Hospital, Kent, United Kingdom

**CONTENT:**
The national incidence of congenital cardiac disorders (CCDs) in the United Kingdom (UK) is up to 8 per 1000 live births. The diagnosis of CCDs in our unit per year would be approximately 34 babies, based on local annual delivery rate of 4330 live births on average, with neonates carrying life-threatening disorders expected to deliver in a cardiac surgical centre. Our neonatal unit is a tertiary non-cardiac centre which works collaboratively with a neonatal cardiac centre through an attending paediatric cardiologist. There are three neonatologists with cardiology expertise in the unit

A retrospective analysis of all cardiac admissions to a tertiary neonatal intensive care unit (NICU) over a five year period from 2014 to 2018. The secondary focus was the unit's performance in detecting and managing neonates with CCDs. For clinical outcomes, information was gathered on basic demographic data, antenatal diagnosis, final cardiologist diagnosis, early management in NICU, time of transfer to cardiac centre, final outcome at the point of last recorded follow up. For unit performance outcomes, information was gathered on agreement between antenatal findings, neonatologist and cardiologist diagnoses, early management, transfer to cardiac centre and mortality prior to transfer.

Sixty nine neonates with CCDs were admitted, accounting for 1.7% of all admissions NICU. The median gestational age and birth weight were 37 weeks and 2695g. Twenty two percent had life-threatening lesions. Aortic anomalies and Tetralogy of Fallot were the commonest acyanotic and cyanotic lesions respectively. Two neonates demised in NICU pre-transfer. Forty two percent were transferred to a cardiac centre. The median transfer age was 11.5 and 32 hours for cyanotic and acyanotic lesions. Ninety one percent had an antenatal diagnosis. Complete diagnostic correlation across antenatal, neonatal and cardiology was 20.3%. One third of the cases had partial agreement, with better correlation between neonatal performed and cardiology performed echocardiograms for cyanotic than for acyanotic lesions. Overall mortality was 8.7% and 27% had undergone a surgical procedure at one year follow up.

Cardiac admissions remained constant over the five years although lower than predicted. The reasons are multifactorial, including elective termination of complex lesions. Antenatal and early neonatal detection of anomalies was satisfactory. Stabilisation in NICU was adequate and early mortality low. Referral and transfer to a cardiac centre was timely. This model of care appears feasible and has potential for safe clinical outcomes.

**IMAGE / TAB:**

**IMAGE / TAB CAPTION:**

**COI:** None declared
TITLE: Bilateral choanal atresia and nasolacrimal duct cysts presenting with persistent respiratory distress in a neonate: a case report
AUTHORS: Shin Tan 1; Anjum Deorukhkar 1
AFFILIATIONS: 1 Queens Medical Centre, Nottingham University Hospitals NHS Trust, Nottingham, UK

CONTENT:
Choanal atresia is a congenital anomaly which results from the developmental failure of the posterior nasal cavity (choanae) to communicate with the nasopharynx. It is the most common form of congenital nasal obstruction. Bilateral choanal atresia is a potentially life-threatening disorder as infants are obligate nose breathers. Approximately 50% of children with bilateral choanal atresia have other congenital anomalies, such as those seen in CHARGE syndrome (coloboma, heart defects, atresia of the choanae, growth retardation, genital and ear abnormalities). A congenital nasolacrimal duct cyst (NLDC) occurs through an obstruction of the Hasner valve, which is in the distal portion of the duct, resulting in dacrocystitis and cyst formation. It is a rare cause of persistent nasal obstruction at birth. The association of both anomalies seems very rare, with only three cases reported in literature.

Male neonate, delivered via spontaneous vaginal delivery at 36 weeks gestation, was noted to have moderate respiratory distress soon after birth. He was initially apnoeic but responded to inflation breaths. He was noted to have moderate chest recessions and tracheal tug. Due to persistent respiratory distress and increasing oxygen requirement, he was intubated and briefly ventilated, and surfactant was administered via endotracheal tube. We were unable to pass a nasogastric tube through both nostrils, raising the suspicion of bilateral choanal atresia. As such, a computed tomography (CT) head scan was arranged. This showed bilateral membranous choanal atresia with fluid pooling within the left nasal cavity, and a 7mm cystic structure at the right medial canthus, secondary to obstruction of the nasolacrimal duct. Some subtle dysmorphic features were also noted, which included hypertelorism, flat nasal bridge and low set ears. As part of the work-up for CHARGE syndrome, an echocardiogram was performed which showed possible mitral regurgitation; this was repeated 8 weeks later, which was normal. Initial genetics (karyotype) blood tests were also normal. He also had an ophthalmology assessment which showed no coloboma. On day 7 of life, marsupialisation of bilateral nasolacrimal cysts was conducted and bilateral choanal atresia opened via an endoscopic approach. The left cyst was filled with pus and was therefore drained. There were no complications intra or post-operatively. He was discharged home without symptoms two days after surgery and is now feeding and growing adequately.

Choanal atresia and nasolacrimal duct cysts are important different diagnoses for persistent nasal obstruction causing respiratory distress in neonates. Although rare, the association between these two disorders highlight the importance of assessing for congenital nasal anomalies in babies with choanal atresia.

IMAGE / TAB:
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=f690e00f1e20982320740b6bcf5dec2e-MjAxOS0wNSM1Y2UyNjY2YzNmMTNh

IMAGE / TAB CAPTION: Figure 1: Image of CT head scan depicting bilateral choanal atresia (green arrows) and congenital nasolacrimal duct cyst (red arrow)

COI: None declared
**ID:** 374  
**TITLE:** Exclusively Human Milk-Based Nutrition for Extremely Low Birth Weight Newborns (case series) - A single center experience  
**AUTHORS:** Veronica M. Samedi 1, Heidi Ludwig-Auser 1, Kaarthigeyan Kalaniti 1  
**AFFILIATIONS:** 1. Royal University Hospital, Saskatoon, Saskatchewan, Canada  

**CONTENT:**  
Successful outcome of prematurity strongly depends on nutrition, especially for extremely low birth weight (ELBW) newborns. Appropriate (quantitative and qualitative) dietary intake could prevent postnatal growth failure and support better auxological and neurodevelopmental outcome. Human milk (HM) alone may not be sufficient for optimal growth, and bovine-based fortifiers (BBF) were traditionally used for preterm babies in the neonatal intensive care unit (NICU) to supplement deficit in calories, proteins and minerals. Unfortunately, cow milk proteins (especially casein Bos d8) is hard on the immature gut, and many ELBW preemies develop symptoms of feeding intolerance after introduction of BBF. A human milk-based human milk fortifier (HM-HMF) e.g. Prolacta® provide with opportunity of fortification that not only complements HM with proteins and minerals, but also help prevent short-term complications like feeding intolerance and in some instances necrotizing enterocolitis (NEC) and also long-term risks of prematurity (metabolic and cardiovascular disease in adulthood). HM-HMF is rich in human milk oligosaccharides (HMOs) that promote growth of Bifidobacterium in the infant’s gut and supports formation of healthy neonatal microbiome. Bioavailability of HM protein is high, thus HM-HMF prevents fat-free mass deficit and central fat mass deposition, a known adverse metabolic outcomes in preterm infants.  

Charts review was conducted in 10 infants on HM-HMF aiming to evaluate feeding tolerance and linear growth. Feeding tolerance was assessed by calculating the total days of nil-per-oral (NPO), duration of total parenteral nutrition (TPN) use and number of abdominal X-rays for suspected NEC. To measure linear growth we used Fenton charts for length (L) and head circumference (HC) (percentile and Z-score) at 32 and 36 weeks of corrected gestational age. Collected data was compared with the similar values from cohort of 5 infants of similar gestation who received BBF in the past (retrospective data).  

Our observations showed that not only growth rate but also linear growth is improving in the infants on HM-HMF. These infants were more successful in achieving full feeds and required fewer abdominal X-rays for suspected feeding intolerance. All 10 infants who received HM-HMF had significantly less days of prolonged TPN and days of NPO compared to their historical cohort.  

Our results are presented in the tables as below:  

Our observations support previous reports of benefits of exclusively human milk-based nutrition for ELBW neonates including optimal weight gain, caloric and protein intake, less episodes of GI symptoms.  

**IMAGE / TAB:**
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**IMAGE / TAB CAPTION:**

**COI:** none declared
ID: 400

TITLE: CORRELATION BETWEEN INSULT SEVERITY AND EARLY MRI/MRS MEASURES IN HYPOTHERMIA TREATED NEWBORN PIGLETS WITH HYPOXIC ISCHEMIC ENCEPHALOPATHY

AUTHORS: Mads Andersen 1; Ted Carl Kejlborg Andelius 1; Mette Vestergård Pedersen 1; Hannah Brogaard Andersen 1; Michael Pedersen 2; Steffen Ringgard 3; Kasper Jacobsen Kyng 1; Tine Brink Henriksen 1

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CONTENT:
Hypoxic ischemic encephalopathy (HIE) is a dynamic process with damage evolving over time after the initial insult. Magnetic resonance imaging and spectroscopy (MRI/MRS) is gold standard for early prognostication in neonates with HIE and is often recommended after 72 hours of birth. The correlation between insult severity and MRI/MRS measures during the first 24 hours of life is uncertain. It is also uncertain how this correlation might be affected by treatment with therapeutic hypothermia (TH). The aim of this study was to investigate the correlation between insult severity and MRI/MRS measures at 6, 12, and 24 hours in newborn piglets with HIE receiving TH or supportive treatment only.

A total of 13 piglets <12 hours of age were anesthetised. Animals were subjected to a standardized hypoxic-ischemic insult by reducing FiO2 to 2-5% during a 45-minute period to achieve aEEG <7 uV and mean arterial blood pressure (MAPB) <70% of baseline for at least 5 minutes. The piglets were treated with whole body TH (33.5-34.0 C) or normothermia. End-hypoxia plasma lactate and aEEG suppression time (<7 uV) served as markers of insult severity. MRI/MRS was performed at 6, 12, and 24 hours after the hypoxic-ischemic insult. Cerebral damage was measured by thalamic apparent diffusion coefficient (ADC) and lactate/N-acetyl-aspartate ratio.

We present preliminary data from the first 7 piglets receiving TH. Data from piglets without TH are still in progress and will be presented at the conference. All piglets survived the hypoxic-ischemic insult and the 24-hour observation period. Hypoxia resulted in aEEG suppression (mean 27 min <7 uV), reduced MAPB (mean 14 min <70% of baseline) and severe metabolic acidosis (mean pH, 7.04; mean plasma lactate, 17 mmol/L). Linear regression analysis showed a correlation between plasma lactate and ADC at 24 hours (P = 0.02). There was no correlation between plasma lactate and lactate/N-acetyl-aspartate ratio and ADC at any other time points (Fig. 1a). Furthermore, there was no correlation between aEEG suppression time and lactate/N-acetyl-aspartate ratio and ADC at any time points (Fig. 1b).

We found a correlation between insult severity measured by plasma lactate and ADC at 24 hours. Data from the animals without TH will further reveal how TH might influence the correlation between insult severity and early measures of MRI/MRS.

IMAGE / TAB:
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IMAGE / TAB CAPTION: Figure 1. Correlation between end-hypoxia plasma lactate and aEEG suppression time and apparent diffusion coefficient (ADC) and lactate/N-acetyl-aspartate ratio (Lac/NAA) in newborn piglets receiving therapeutic hypothermia at 6, 12, and 24 hours.

COI: None declared.
ID: 403
TITLE: LIPID OVERDOSE IN A PRETERM NEONATE: LESSONS LEARNT FROM MEDICATION ERROR
AUTHORS: Sonal Datir 1, Charlotte Sewsarran 1, Gopa Sarkar 1
AFFILIATIONS: 1 Neonatal unit, Stoke Mandeville Hospital, Aylesbury, United Kingdom

CONTENT:
Medication errors can cause significant harm, but are a preventable cause of morbidity and mortality in the presence of effective intervention strategies. The complexity of intravenous medication administration in neonates involves an increased risk of medication errors. Also, neonates have a less capacity to buffer the unintended consequences of the medication error due to physiological immaturity.

Lipids are considered as high alert medication and overdose can cause significant complications including hypertriglyceridemia, respiratory failure, metabolic acidosis, hemolysis, liver dysfunction, and pancreatitis. Long-term complications include pulmonary hypertension, bronchopulmonary dysplasia, and neurodevelopmental delays.

The aim of this report was to highlight the intervention strategies and learning involved in a medication error due to lipid overdose.

A baby boy born at 29 weeks was commenced on Parenteral Nutrition (PN) at corrected 32 weeks for suspected Necrotising Enterocolitis (NEC). The infusion was ‘checked’ by two trained nurses when the new PN was commenced and at two subsequent handovers; with hourly pump readings. Later, the infusion pump delivering lipid alarmed as the bag was empty. This prompted a review of fluid chart balance only to note that the infusion rate of lipids was set incorrectly; 120mls of lipid was infused; instead of expected 17.1mls (7 times higher).

The baby had mild respiratory distress; rest of the observations were stable. After noticing the error, the lipid infusion was discontinued. The triglyceride levels were noted to be very high 83.8mmol/l (Normal 0.34 – 2.08 mmol/l). The baby was transferred to tertiary neonatal unit, required respiratory support in the form of nasal cannula oxygen and received a double volume exchange transfusion. The baby was clinically stable and was monitored closely for further complications. Parents were updated and supported throughout.

National Patient Safety Agency (NPSA) alert was raised and the incident was reported. A serious incident root-cause analysis was carried out to identify the opportunities to minimise the recurrence of the error. The case illustrated a lack of robust checking system and no clearly identifiable process to differentiate between multiple infusions. This emphasised on verbal challenge- response process to minimise the risk of errors. It involved independent checks by two trained nurses, and cot side checklist during handover to be read out and checked (and to be signed by two qualified nurses) to allow checking of pumps and rates to overcome involuntary automaticity.

The process of the administration of PN in neonatal unit was reviewed to include a detailed workflow diagram to identify specific problem areas. The changes that were introduced included colour coded bags, use of clear labels and infusions were set to run for a maximum of 4 hours.

A competency based workbook was developed to improve uniformity in practice with regards to administrations of medication including PN. Debrief session and shared learning was organised for all neonatal staff, reinforcing the lessons learnt and incorporating into neonatal mandatory training.

Our investigation led to a major change in manufacturing nationwide. Based on the recommendations, the volume in lipid bags was reduced from 120 mls to 60 mls and the colour was changed to red coloured bags to help in clear identification.

Exchange transfusion remains the mainstay of treatment for lipid overdose to prevent acute and delayed complications. Human factors play a crucial role. Identifying human errors and developing robust intervention strategies is challenging but very important.

Medication safety in neonatal care involves regular education and training of the staff; debriefs and shared learning from errors, and timely review of the practices.
IMAGE / TAB:
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IMAGE / TAB CAPTION: Diagram representing the infusions highlighting the medication error

COI: None declared
PLEURAL EMPYEMA DUE TO ESCHERICHIA COLI IN A NEWBORN: A CASE REPORT

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Pleural empyema is a rare and serious complication of pneumonia. Although it is frequently seen in children, there are only a few reports about pleural empyema in newborn infants. Empyema is defined by a positive pleural effusion culture or purulent effusion with elevated white blood cell count and a higher percentage of polymorphonucleate cells. Failure to control the pleural effusion may lead to progressive disease and can result in complicated parapneumonic effusions, due to the presence of viscous fluid with fibrinous debris resulting in multiple loculations in pleural space. In this report we describe a case of pleural empyema caused by E. Coli.

A 48 hour-old term boy born by spontaneous delivery was admitted to our Neonatal Intensive Care Unit (NICU) because of respiratory distress. The mother had no previous history of neither premature rupture of membranes nor chorioamnionitis, but she received a single dose of intravenous ampicillin 90%. On day 3 of life infant’s respiratory condition worsened, more pronounced intercostal and substernal retractions were noted and breath sounds could not be heard on the left lung. Control chest X-ray showed shift of the mediastinum to the right, atelectasis and pleural effusion on the left side. In thoracic ultrasonography (US), air bronchogram, lung parenchyma consolidation, pleural thickening, fluid hyperechoic pleural collection (20 mm) compatible with empyema were observed on the left lung. Fifty ml of pleural fluid were drained by thoracentesis. Pleural effusion was purulent in character: elevated white cell count (90,042/mm3) and high percentage of polymorphonucleate cells (62,000/mm3). E. Coli was isolated from blood and pleural fluid cultures so targeted antibiotic therapy with meropenem and ceftriaxone was started. A second therapeutic thoracentesis (30 ml) was performed on day 5 of life. Nevertheless, the infant’s lung US follow-up showed an inadequate response to i.v. antibiotics witnessed by the persistence of pleural effusion and the appearance of cystic lesions, interpreted as a loculated pleural empyema. For this reason on day 18 of life a chest tube was placed and the infant was treated with intrapleural urokinase. Urokinase 10,000 units was diluted in 10 ml of saline and given via chest drain every 12 hours for five days. After giving the solution, the chest tube was kept close for 2-3 hours, then the fluid re-aspirated. After intrapleural fibrinolytic therapy, both chest X-ray and thoracic ultrasound confirmed the decreasing in left pleural effusion and a slow but progressive resolution of the cystic lesions. Antibiotic treatment was given for four weeks. In the following weeks the baby showed quick clinical improvement: inflammation markers got normal and he underwent full enteral feeding by increasing volumes of milk. The infant was discharged on day 49 of life in good conditions and addressed to a respiratory follow-up.

In neonates, empyema is a rare but potentially fatal condition. Chest X-ray and US are helpful in the diagnosis and monitoring of pleural effusion. Pleural fluid culture is an important diagnostic tool. Thoracentesis and chest drain placement are indicated in cases of respiratory compromise. Fibrinolysis can help in resolving the disease when complicated and, according to the literature, may shorten hospital stay and obviate surgery.
ID: 427

TITLE: LUNG ULTRASOUND IN NEONATES - CAN REPLACE CHEST X-RAY?

AUTHORS: Manuela Cucerea 1; Raluca Marian 2; Laura Mihaela Suciu 1; Elena Moldovan 3; Marta Simon 1

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CONTENT:
Although lung ultrasound (LUS) has been disregarded for a long time because of the presence of air which causes complete reflexion of the ultrasound beam, the sonographic assessment of the neonatal lung is suitable in many respiratory pathologies such as lung consolidation, pleural effusions, pneumothorax, interstitial syndrome or congenital malformations of the lung or diaphragm.

The authors report a series of five cases of newborns admitted in Neonatology Department of one tertiary level unit in 2019, which have been diagnosed with: group B Streptococcus Pneumonia, Pneumothorax, Chylothorax, Pulmonary sequestration and Diaphragmatic hernia, respectively. Bedside LUS examination findings performed with a linear array probe (frequency of 9.0–12.0 MHz) of neonates with respiratory distress were compared with routine plain chest X-ray (CXR) findings. Case 1: term newborn with clinical signs of pneumonia, whose CXR shows confluent alveolar opacities and LUS highlighted an area of lung consolidation in the right lower lobe, associated with pleural effusion. Case 2: term newborn with lower left-sided diminished vesicular murmur, which on CXR showed a left pneumothorax, and LUS revealed the presence of ‘lung point’ pathognomonic for pneumothorax. Case 3: late preterm newborn antenatally diagnosed with severe bilateral pleural effusion and treated with pleuro-amniotic shunting, which on CXR showed opacification of lung fields and presence of chest tubes inserted antenataly. LUS showed the borders of the pleural effusion (the quad sign) and the sinusoid sign visible in M-mode. Case 4: term newborn antenatally diagnosed with a pulmonary mass with a cystic component near the right diaphragm, whose CXR shows only a discreet blurring of the right lung, but LUS revealed an echogenic lesion with a large cyst occupying the posterior basal segment of the right lung, with feeding vessel identified by Doppler examination. Case 5: term newborn with antenatal suspicion of left diaphragmatic hernia, whose CXR shows opacification of the left hemithorax, and postnatal LUS identified intrathoracic stomach, liver, intestines, but no ipsilateral lung tissue.

Lung ultrasound – a noninvasive and safe imaging investigation – is superior to chest radiography in terms of acquisition time, and it may be the technique of choice to evaluate neonatal respiratory pathology, if performed by an experienced sonographer/neonatologist.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 452

TITLE: IS THE CARDIOTHORACIC RATIO IN VERY LOW BIRTH WEIGHT INFANTS WITH SEPTIC SHOCK ASSOCIATED TO MORTALITY?

AUTHORS: Maiolini, BL1, Martins-Celini, FP1, Toffolo, RO1, Aragon, DC1, Calixto, C1, Carnevale-Silva, A1, Ferreira, CHF1, Silva, ACB1, Fukamichi, SL1, Martins-Filho, PF1, Souza, GA1, Souza, TR1, Couto, LDCA1, Gonçalves-Ferri, W.A.

AFFILIATIONS: 1Department of Pediatrics, Ribeirão Preto School of Medicine, University of São Paulo, Brazil

CONTENT:
An increase in cardiac area may be a sign of heart failure. In adults with septic shock, the enlargement of cardiac chambers may be a reflex of good hemodynamic adaptation and is associated with favorable outcomes. The echocardiogram may identify this adaptation, but few intensive care units may available this resource. The analysis of the cardiothoracic ratio (CTR) in the chest X-ray may be useful as a bedside tool in the evaluation of hemodynamic adaptation and predictor of outcomes, although its validity is not known. The objective of this study was to investigate the association between changes in CTR and unfavorable outcomes among very low birth weight preterm infants with septic shock.

Retrospective cohort study. Included preterm infants 5% during shock. Group 2: patients with inaltered CTR (<5% variation). Group 3: patients with CTR decrease <5% during shock. Frequency of occurrence and averages were calculated. To evaluate the association between changes in CTR and death, crude and adjusted relative risks were estimated by fitting log-binomial regression models. Considered gestational age as covariate in multiple model.

Three hundred and forty four patients were selected for the study. Among them, 94 (27.3%) had late-onset sepsis and 48 (51.0%) septic shock. Excluded 27 preterm infants and 21 completed the study. Group 1: 9 (42.9%) patients, Group 2: 5 (23.8%) and Group 3: 7 (33.3%). Mean gestational age was 27.15 weeks (SD= 2.2) and mean birth-weight 888.97 grams (SD= 248.0). Death occurrences in Groups 1, 2 and 3 were, respectively, 3 (33.3%), 3 (60.0%) and 4 (57.1%). Also, comparative analysis between Group 1 (CTR increase) and the other groups presented no statistical significance (RRadj 1.49 [95%CI: 0.50;4.47]). Also, a similar result was found when comparing Increase and Decrease of CTR groups (RRaj =1.74 [95%CI: 0.50; 6.08]). Although not statistically significant, it was observed a trend in improve survival rate in patients with increased CTR during septic shock (Group 1) (Table 1).

In this study, the cardiothoracic ratio is not associated with unfavorable outcomes in VLBW infants with septic shock, however, a trend in improve survival rate was found among preterm infants with increased CTR during septic shock. Other studies with more patients are required to confirm this result.

IMAGE / TAB:
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IMAGE / TAB CAPTION:

COI: None declared
ID: 455

TITLE: CARDIOTHORACIC RATIO PERFORMANCE AS BEDSIDE TOOL FOR PREDICTING UNFAVORABLE OUTCOMES IN VERY LOW BIRTH WEIGHT INFANTS WITH SEPTIC SHOCK

AUTHORS: Martins-Celini, FP1, Maiolini, BL1, Toffolo, RO1, Aragon, DC1, Carnevale-Silva, A1, Calixto, C1, Ferreira, CHF1, Souza, GA1, Silva, ACB1, Fukamichi, SL1, Martins-Filho, PF1, Souza, TR1, Couto, LDCA1, Gonçalves-Ferri WA1

AFFILIATIONS: 1Department of Pediatrics, Ribeirão Preto School of Medicine, University of São Paulo, Brazil.

CONTENT:
Hemodynamic changes in neonatal septic shock are still not fully understood. Diminished peripheral vascular resistance and myocardial function are previously described. Increase in cardiac area was thought of being a sign of severity and heart failure. Echocardiogram may identify myocardial disfunction, but it is a limited resource in most intensive care units. The cardiothoracic ratio (CTR) may pose as a useful tool in this evaluation, although its validity in preterm patients is not known.

The objective of this study was to evaluate the cardiothoracic ratio as bedside tool for predicting unfavorable outcomes during septic shock in Very Low Birth Weight infants (VLBW).

Retrospective cohort study. Included: preterm infants with <1500g birth weight with late-onset sepsis and septic shock, born between April 11 2016 and December 31 2018. Excluded: malformation, cardiac defects, genetic syndromes, severe perinerventricular hemorrhage, lack of data and change in ventilatory mode during the evaluation. For descriptive analysis frequency of occurrence and means with standard deviations were calculated. CTR was assessed by a single examinator before and during septic shock. A ROC curve was made to analyze the association between CTR changes during septic shock and death. Nonparametric Wilcoxon test was used to analyze the association between birth weight and gestational age, average airway pressure, CTR changes and death.

Three hundred forty four patients were selected. Among them, 94 (27.3%) had late-onset sepsis and 48 (51.0%) septic shock. Twenty one completed the study after application of exclusion criteria. Gestational age mean was 27.15 weeks (SD= 2.2) and birth-weight mean was 888.97 grams (SD= 248.0). No relevant difference in weight (p-value= 0.28), gestational age (p-value=0.34), average airway pressure (p-value=0.26) or CTR increase (p-value=0.73) were found between patients who died or survived. Death rate was 47.6% (10/21). No association between CTR changes during septic shock and death, as shown in Figure 1 [AUC (95%CI) = 0.54 (0.32; 0.75)].

No association between CTR changes and death was found. These results suggests that the use of CTR as severity marker or myocardial disfunction indicator in VLBW infants with septic shock does not presented good performance as a diagnostic test. Further studies with more patients are required to confirm these findings.

IMAGE / TAB:
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IMAGE / TAB CAPTION:

COI: None declared
ID: 458

**TITLE:** Three atypical presentations of invasive candidiasis in the NICU: stay alert!

**AUTHORS:** G.M. Mahon 1; M.A.C. Hemels 1; S.B. Debast 2; H.L.M. van Straaten 1; A.C. Dutman 3; E.J. d’Haens 1

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2 Laboratory of Medical Microbiology and Infectious Diseases, Isala, Zwolle, the Netherlands
3 Department of Pathology, Isala Zwolle, The Netherlands

**CONTENT:**

Invasive candidiasis (IC), most frequently caused by Candida albicans (C. albicans), is an important cause of morbidity and mortality in premature neonates. Incidence of IC has reduced in the last decade due to antibiotic stewardship and bundles of care. The incidence in the Netherlands nowadays is < 1%. The most significant risk factor is extremely low birth weight, <1,000g (ELBW). Other important risk factors include vaginal delivery, maternal vaginal colonisation with Candida, use of broad-spectrum antibiotics and use of endotracheal tubes and central venous catheters. We describe three atypical presentations of C. albicans sepsis in the neonatal intensive care unit (NICU).

**Case 1:**
Premature male, born at 27 weeks and 2 days gestational age (GA), birthweight 1230 grams, APGAR score 1/4/7. The pregnancy was complicated by a placenta praevia marginalis with blood loss and prolonged premature rupture of membranes (PPROM). Vaginal culture was negative for Candida. A caesarean section was carried out due to suspected maternal sepsis. The neonate was respiratory and circulatory insufficient after birth, requiring ventilation and volume resuscitation. Empiric antibiotics for early onset neonatal sepsis were started immediately after birth. Less than 12 hours postnatally, fluconazole (6 mg/kg/72 hours IV) was also started because of a suspected candidiasis, where macroscopic white spots were observed on the umbilical cord by the pathologist. Fungal invasion was microscopically confirmed. Maternal blood culture became also positive for C. albicans. The first neonatal blood culture was negative, although stomach and ear cultures on admission were positive for C. albicans. A subsequent blood culture 6 days postnatally, revealed C. albicans despite the fluconazole treatment. Fluconazole was continued in a higher dose (12 mg/kg/24 hours IV) for 3 weeks after the first negative blood culture and resulted in successful treatment. An extensive investigation revealed no dissemination of the candidiasis (lumbar puncture, urine culture, cranial, cardial and abdominal ultrasound and ophthalmologist review).

**Case 2:**
Premature male, born by spontaneous vaginal delivery, without PPROM, at 25 weeks GA, birthweight 750 grams, APGAR score 3/6/7. He was intubated after birth due to inadequate respiratory drive. Empiric antibiotics for early onset neonatal sepsis were started immediately after birth and discontinued after 48 hours because of a low CRP and negative blood culture. 48 hours postnatally, prophylactic fluconazole (6 mg/kg/72 hours IV) was started because of a positive maternal vaginal culture for C. albicans and was switched to enteral nystatin on day 7. On day 10 there was suspicion of a late onset sepsis, which coincided with signs of diaper dermatitis. Routine surveillance cultures were positive for C. albicans and fluconazol (6 mg/kg/72 hours IV) was restarted. 48 hours after the clinical deterioration, a phlebitis became evident at the insertion point of an intravenous cannula on the left ankle and this developed into an abscess. At this point, both blood culture and a sample taken from the abscess tested positive for C. albicans. The fluconazole dose was increased to 12 mg/kg/48 hours IV. Extensive investigations revealed no signs of dissemination. However, a lumbar puncture was not carried out due to the presence of an intra-ventricular haemorrhage. Therefore, fluconazole treatment was continued for 6 weeks after the first negative blood culture.

**Case 3:**
Premature male born by spontaneous vaginal delivery, at 28 weeks and 2 days GA, birthweight 1380 grams, APGAR score 4/6/8. A cerclage was placed during pregnancy due to two immature deliveries at 19 weeks GA in the mother’s obstetric history. Pregnancy was complicated by a suspected infection based on a high maternal CRP. Vaginal cultures were negative. Empiric antibiotics for early onset neonatal sepsis were started immediately after birth. There were no clinical signs of infection in the neonate. Five days postnatally, a diaper dermatitis developed and a skin culture proved positive for C.
Candida albicans, which was treated with local miconazole. Two days later, fluconazole (12 mg/kg/24 hours IV) was started due to clinical deterioration despite antibiotic treatment. The blood culture revealed C. albicans. The culture of cerebrospinal fluid performed a week after starting fluconazole, was negative. Further dissemination was ruled out. Two weeks later multiple echo densities suspicious for Candida brain micro abscesses were seen on routine cranial ultrasound. An MRI showed multiple miliary nodules not typical for active abscesses. Beta-D-glucan, a highly sensitive marker of fungal infection was tested retrospectively in the cerebrospinal fluid and proved positive with a high titre, confirming cerebral involvement. Fluconazol IV was continued for a total of 6 weeks. The multiple echo densities on cerebral ultrasound slowly diminished in the next weeks. Neurodevelopmental outcome was normal at the age of 6 months.

We presented a perinatal invasive candidiasis (IC) first diagnosed by the presence of macroscopic white spots on the umbilical cord, an IC with abscess development and an IC with cerebral involvement despite the absence of known risk factors. These 3 case reports demonstrate the possibility of atypical presentation despite the low incidence in the Netherlands and highlight the need for extra vigilance in the diagnosis of IC in premature neonates.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 464

TITLE: “SODIUM BICARBONATE ADMINISTRATION ON METABOLIC ACIDOSIS IN VERY LOW BIRTH WEIGHT PRETERM INFANTS WITH SEPTIC SHOCK IS A FUTILE TREATMENT”

AUTHORS: Toffolo, RO, Martins-Celini, FP, Maiolini, BL, Aragon, DC, Calixto, C, Ferreira, CHF, Silva, AC, Gonçaves, AB; Silva, ACB, Souza, GA, Couto, LDCA, Martins Filho, PF, Fukamichi, SL, Souza, TR, Gonçalves-Ferri, WA.

AFFILIATIONS: Department of Pediatrics, Ribeirão Preto School of Medicine, University of São Paulo, Brazil

CONTENT:
Sodium bicarbonate is a hyperosmolar solution potentially harmful. Studies suggest that the administration of sodium bicarbonate in patients with shock and metabolic acidosis could improve the action of vasoactive amines, although its efficacy is not yet proven. Despite controversial opinions, sodium bicarbonate administration is largely used in clinical practice for neonatal patients with metabolic acidosis and septic shock. The objective of this study was to evaluate the impact of sodium bicarbonate administration on improvements in gasometric values and vasoactive amines reduction in very low birth weight (VLBW) preterm infants with septic shock.

Retrospective cohort study. Included VLBW preterm infants born in a tertiary hospital between April, 11th 2016 and December, 31th 2018, with diagnosis of late-onset sepsis, septic shock, metabolic acidosis (pH < 7.2 and pCO2 < 45) that received sodium bicarbonate. Patients with congenital malformation, genetic syndromes and lack of data were excluded. A measurement of arterial blood gas was performed before and after sodium bicarbonate administration in the same patient and was registered possible modification of vasoactive amines during six hours after sodium bicarbonate administration. For descriptive analysis frequency of occurrence and averages with their respective standard deviations were calculated. Comparative analysis was performed using t-Student test for paired data.

Nineteen preterm infants were selected to this study, but only 16 completed the study after applying exclusion criteria. The mean of gestational age at birth was 27.21 weeks (SD 2.35). Mean and standard deviation of gasometric parameters before and after sodium bicarbonate administration were, respectively: pH = 7.03 (SD = 0.13) vs 7.06 (SD = 0.21); HCO3 = 11.19 (SD = 3.06) vs 12.14 (SD = 3.63); BE = -18.52 (SD = 4.67) vs -16.59 (SD = 5.70); pCO2 = 42.43 (SD = 9.15) vs 46.8 (SD = 18.99). There was no significant difference between blood gas parameters before or after sodium bicarbonate infusion, as shown in Table 1. It was possible to reduce dosage of vasoactive amines in only 4 patients (25%) 6 hours after sodium bicarbonate infusion. In 8 patients (75%), there was increase in vasoactive amines usage or introduction of a new drug.

In the current study, it was not observed improvement on blood gas values or impact on reduction of vasoactive amines use with sodium bicarbonate infusion in VLBW preterm infants with septic shock, therefore the data suggests that its use should be avoided. New studies must be conducted about this subject.

IMAGE / TAB:
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IMAGE / TAB CAPTION:

COI: None declared
ID: 485  
TITLE: 8 YEARS ON AND 8000 MINUTES: DOCTORS’ WORKFLOW IN A TERTIARY NEONATAL INTENSIVE CARE UNIT (NICU)  
AUTHORS: Thomas Pike 1; Anna Taylor 1; Cora Doherty 2  
AFFILIATIONS: 1 School of Medicine, Cardiff University, United Kingdom  
2 Department of Child Health, Cardiff University, United Kingdom  

CONTENT:  
In the hospital setting wasteful activities can impact the time for direct patient contact. In 2011, the activity of doctors at the regional tertiary University Hospital of Wales (UHW) NICU was observed in a time and motion study. This was inspired by the ‘Productive Ward’ and ‘Transforming Care’ initiatives of the NHS which empower ward teams to redesign and streamline work processes. Since 2011, several ‘Quality Improvement’ processes have been implemented, focussing on efficiency and reducing unnecessary testing. We aimed to determine the impact of these changes on doctors’ activity by comparing current activity with 2011 data with particular emphasis on ‘wasted’ time and interruptions.  

The activity of 5 NICU doctors (3 SHOs and 2 SpRs) was monitored on a minute by minute basis in a quantitative time and motion observational study at UHW. Verbal consent was obtained to follow each doctor over a 12 hour ICU weekday shift (0900-2100), totalling 3600 minutes of activity. Selection of days and doctors was random. A standardised activity pro-forma was used to record observations. Doctors’ distance travelled, fluid intake and number of toilet trips were also noted to gauge hydration status. Clinician activity was timed using a digital stopwatch and steps measured with a pedometer application. ‘Wasted’ time was defined as any unnecessary motion not related to the task being performed. An ‘interruption’ was any event that required the clinician to stop their current activity.  

‘Wasted’ time, interruptions and distance travelled per shift reduced by 38% (p=0.01), 80% (p=0.0005) and 55% (p=0.0007) respectively. These findings may reflect an increase in staff, training advancements, improved availability of guidelines and practical design of the unit. The other activity categories showed no statistically significant difference. The largest proportion of shift time was dedicated to direct patient contact in both 2011 (33%) and 2019 (36%). Time performing capillary blood gases was 25 minutes less per shift. In 2019, sepsis screens took on average 26 minutes per shift, the most of any clinical procedure. SpRs (tier 2) spent more minutes in discussion but less time completing medical documentation compared to SHOs (tier 1). Fluid intake was approximately 800mls, less than half the recommended daily water intake by the European Food Safety Authority.  

‘Wasted’ time, interruptions and distance travelled all decreased from 2011 to 2019. This may be due to multiple unit changes and the conscious effort of clinicians to be more efficient at work. Fluid intake by doctors is inadequate. This study has not been able to conclude the areas of workflow that have benefited from the reduction in ‘wasted’ time. Further monitoring in this field may help clarify wasted time and improve efficiency further.  

IMAGE / TAB:  
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=7f1929e063f6646cac5c b99b5c3d0c1f-MjAxOS0wNSM1Y2UyNjY2YzcwZTQ5  

IMAGE / TAB CAPTION:  

COI: None declared
TITLE: NEURODEVELOPMENTAL OUTCOME IN INFANTS WITH NEC; IS COMPROMISED CEREBRAL OXYGENATION THE EXPLANATION?

AUTHORS: Claire Howarth 1,2; Jayanta Banerjee 3,4; Terence Leung 5; Simon Eaton 6, Joan Morris 7; Narendra Aladangady 1,2

AFFILIATIONS: 1 = Homerton University Hospital NHS Foundation Trust, London, England
2 = Queen Mary University of London, London, England
3 = Imperial College Healthcare NHS Trust, London, England
4 = Imperial College London, UK
5 = University College London, London, England
6 = University College London Great Ormond Street Institute of Child Health, London, England
7 = St George's, University of London, London, England

CONTENT:
Despite improvements in neonatal care the morbidity and mortality associated with Necrotising Enterocolitis (NEC) remains high. In particular preterm infants with NEC are known to have worse neurodevelopmental outcomes than those without NEC.

We previously established normal ranges of Near Infrared Spectroscopy (NIRS) measurements of regional tissue oxygenation in preterm infants. We now aimed to examine whether cerebral oxygenation differs in those infants who develop NEC compared with those who do not develop NEC.

We examined 48 infants <30w gestation admitted to our tertiary level NICU (after ethical approval and informed consent) from Oct 2016 to May 2018. Exclusion criteria: birthweight ≤2nd centile, abnormal antenatal dopplers, major congenital anomalies or Twin to Twin Transfusion Syndrome.

NIRS (NIRO-300, Hamamatsu KK, Japan) probes were placed on the abdomen and forehead weekly for 60 minutes allowing simultaneous measurement of gut (sTOI) and cerebral (cTOI) Tissue Oxygenation Index. Subsequently Fractional Tissue Oxygen Extraction (FTOE) and Splanchnic Cerebral Oxygenation Ratio (SCOR) were calculated. Weekly clinical status was also recorded and NEC was defined as ≥Bells stage 2.

Median birthweight 884g (460-1600), median gestational age 26+3 weeks (23+0-29+6) and 52% female.

271 NIRS measurements were completed and 7 infants developed NEC. NIRS measurements from 5 infants that developed Haemorrhagic Parenchymal Infarcts (HPI) were excluded from analysis.

Infants who developed NEC had significantly lower cerebral oxygenation levels than those that did not develop NEC, even when adjusted for confounders such as PDA, enteral feeds, gender and Haemoglobin (table 1).

NEC is a recognised independent risk factor of worse neurodevelopmental outcomes in premature infants. However, there is no substantial evidence to support a pathogenetic mechanism. Findings from our study indicate that infants with NEC have a significantly lower cerebral tissue oxygenation in comparison to those who did not develop NEC. This is a novel finding which could explain their worse neurodevelopmental outcome.

IMAGE / TAB:
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=258e75e6e14294743ae72018d3d56fc7-MjAxOS0wNSM1Y2UyNjY2Yzc1OTc0

IMAGE / TAB CAPTION: Table 1: Cerebral NIRS measurements in those infants with NEC compared with infants without NEC.

COI: none declared
ID: 505

TITLE: Should Somatostatin be used as first-line agent in management of Congenital Chylothorax?

AUTHORS: Therese Mary William

AFFILIATIONS: Lewisham University Hospital, London, UK

CONTENT:

Congenital chylothorax is defined as abnormal accumulation of lymphatic fluid in the pleural space and may be either congenital or an acquired condition. Although congenital chylous effusions are relatively rare in infancy, they have serious clinical consequences and can be potentially life-threatening disorder. To the best of our knowledge there are no evidence-based guidelines to support the use of octreotide as first-line agent in chylothorax management. In our case the accumulation of chylothorax has been reduced significantly and treated successfully after the administration of octreotide. We aim to provide guidance for the optimal management of Congenital Chylothorax in Infancy.

Some case reports including this one suggest that there may be more patients with trisomy 21 syndrome associated with congenital chylothorax. Therefore, congenital chylothorax might be listed as one of trisomy 21 syndrome complications. The MCT diets have been used as first-line agent in congenital chylothorax management, however, its efficacy has met with variable success in the treatment of chylothorax. In our case the accumulation of chylothorax has been treated successfully, and diminished significantly after the administration of octreotide. Therefore, octreotide may be used as first-line along with adjunctive therapy of parental nutrition and intercostal decompression of the pleural effusion. The early administration of Octrotide may allow the patient to avoid invasive procedures.

A premature baby born at 30 weeks gestation, diagnosed antenatally with trisomy 21 syndrome and severe bilateral congenital pleural effusions which subsequently confirmed after birth as chylothorax. Due to the large size of the effusion which compromised the respiratory system, bilateral thoracentesis were performed and bilateral chest tubes were inserted soon after birth. Expressed Breast milk and Medium-chain triglyceride (MCT) formula was introduced in the first 2 weeks of life. However, chylothoraces re-accumulated which required another bilateral thoracentesis and bilateral chest tubes. Congenital chylothorax was reduced significantly and treated successfully after administration of Octreotide infusion along with intercostal decompression of the pleural effusion and total parental nutrition as adjunctive therapy. Our case showed that octreotide is a relatively safe drug, and far more effective than MCT in resolving the chylothorax.

This case is of particular interest as it provides further evidence for the efficacy of octreotide in the management of chylothorax. Therefore, octreotide may be used as first-line agent along with adjunctive therapy of parental nutrition and intercostal decompression of the pleural effusion. The ultimate aim is to improve patient safety and clinical outcome through appropriate management.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: No Conflict of interest.
ID: 507

TITLE: COMPARATIVE EVALUATION OF COGNITIVE CORTEX HEMODYNAMICS IN PREMATURE TRIPLETONS ACCORDING TO BIRTH ORDER DURING THE EARLY POSTNATAL PERIOD: A NEAR-INFRARED SPECTROSCOPY (NIRS) STUDY

AUTHORS: Evangelia Giougi 1; Paraskevi Karagianni 2; Georgios Mitsiakos 3; Pagona Chouchou 3; Vasiliki Soumbasi-Griva 5

AFFILIATIONS: 2 NICU, Aristotle University of Thessaloniki, General Hospital ’Papageorgiou’, Thessaloniki, Greece

CONTENT:

Background: The rise of triple births as a result of the extended use of assisted reproductive technologies pose serious potential risks to infants; among others, the rate of perinatal stress is found increased for the 2nd neonate compared to the 1st, as well as for the 3rd compared to the 2nd neonate. A pathologic perfusion of the cognitive cortex during the 1st week of life is associated with cognitive morbidity in the long term.

Aim: To investigate the impact of birth order in cerebral oxygenation of premature triplet neonates and compare the evolution of cognitive cortex hemodynamics among the three infant groups during extrauterine adaptation in the early postnatal period.

Subjects/Methods: We studied the neonates of seven triplet trichorionic pregnancies with normal umbilical artery dopplers, antenatal steroid administration and delivery by elective c-section. Neonates were recorded on the 1st, 3rd and 5th postnatal day at a spontaneous sleeping state using the NIRO-200 system to evaluate the Tissue Oxygenation Index (TOI) and the normalized Tissue Hemoglobin Index (nTHI). A detector probe was placed on the left and right forehead, at the junction point of the frontal, parietal and temporal cortex relative to cognitive functions. Brain ultrasound, mean arterial pressure, hematocrit, blood glucose, oxygenation and aeration indexes were verified before each record. Statistical analysis was performed with SPSS 17.0 using Mann-Witney and One-way ANOVA test.

Results: The median gestational age (±SD) was 32.6±1.1 wks and the median birth weights (±SD) were 1778±225gr, 1768±289gr and 1765±344gr for the 1st, 2nd and 3rd triplets, respectively. The median (±SD) pH values in umbilical arterial samples were 7.36±0.02 (SBE:-1.9±2.3), 7.35±0.02 (SBE:-2.2±2.1) and 7.38±0.03 (SBE:-1.8±2.5) for the 1st, 2nd and 3rd triplets, respectively. All neonates remained hemodynamically stable. Brain ultrasounds were normal for gestational age. Fifteen neonates required nCPAP during the 1st record, 8 during the 2nd and 3 during the 3rd with mean FiO2 requirements 28.3%, 25.6% και 21% respectively. TOI and THI ranged within normal levels without statistically significant differences on the 1st, 3rd and 5th record in the 3 population groups (Table 1).

NIRS data reveals that cerebral oxygenation of stable preterm tripletons with uncomplicated delivery is not influenced by birth order. Similarly, the cognitive cortex shows a normal hemodynamic evolution during the early postnatal period.

IMAGE / TAB:

IMAGE / TAB CAPTION: Table 1: Tissue oxygenation index (TOI) and tissue hemoglobin index (THI) in each group

<table>
<thead>
<tr>
<th></th>
<th>1st triplet group</th>
<th>2nd triplet group</th>
<th>3rd triplet group</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOI1</td>
<td>71.8±8,4</td>
<td>62±11,4</td>
<td>68,4±5,9</td>
</tr>
<tr>
<td>nTHI1</td>
<td>1,08±0,42</td>
<td>0,93±0,24</td>
<td>0,96±0,25</td>
</tr>
<tr>
<td>TOI2</td>
<td>65,1±6,0</td>
<td>65±6,5</td>
<td>62,5±12,7</td>
</tr>
<tr>
<td>nTHI2</td>
<td>1,11±0,3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

COI: None declared
ID: 517
TITLE: Is Crying Allowed?
AUTHORS: Rashmi Mehta
AFFILIATIONS: Birmingham Women’s and Children’s Hospital

CONTENT:
Death is part of life, though it’s not expected, at the beginning of life, at the verge of being born. Hope, expectations and signs of life are meant to bring joyous happiness. But unexpected death, over a period of few minutes or gradual deterioration over few days or months fills us with grief and sadness. We live in floating world of ‘disenfranchised grief’ (grief experienced when there is loss that is not or cannot be openly acknowledged, publicly mourned, or socially supported). Nevertheless we do empathise with parents and grieve along with them, even though we might have known them for just few minutes and shed tears. Does crying make us emotionally weak, guilty or unprofessional?

Disenfranchised grief is particularly relevant to medical professionals, wherein one is not particularly close to a parent, but still able to feel their grief and mourn with them. As part of grieving process, we should be able to pay heed to our own emotions and understand them.

An internet search to look at whether doctors cry and grieve with the parents and the attitudes of both other professionals and parents whilst dealing with it. Some of these studies/articles/blogs/books were hand picked for this review. A poll conducted by Gulland A (2014) on BMJ’s community web-site, out of 528 people, 138 (26%) said that doctors should not cry under any circumstances. Wagner et al (1997) in their survey found 57% of doctors had cried at work in the hospital at least once.

Parents describe warm and sincere display of emotion at the time their child’s death as moving “...some of the young doctors were in tears...” (Meert et al 2008). Crowe L (2019) in her blog talks about crying, not able to sleep and rumination of the events in question and those in past. These raw emotions are often faced by many doctors, but not often talked openly. A Haaland, encouraging to manage these emerging emotions and vulnerability says, “the main benefit of becoming aware of your emotions is that you can then recognise when you’re in danger of burning out and can take action to prevent it.” (Robinson 2019). “When we strive to make a difference in the lives of our patients, our patients also touch our lives. Making sense of death involves the creation of an internal narrative, which requires adequate time and guidance to heal from guilt, sadness, isolation, and conflict.” (Kim 2019).

Frank A (1991), emphasising on mourning mentions, “To grieve well is to value what you have lost. When you value even the feeling of loss, you value life itself, and you begin to live again.” In a caring empathetic society, ‘disenfranchised grief’ should be acknowledged and crying allowed. We should be making more effort in talking openly about grief amongst our colleagues, embed it in our curriculum and include in our debriefing strategies.

IMAGE / TAB:
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IMAGE / TAB CAPTION: Is Crying Allowed?

COI: None declared

References:
ID: 537

TITLE: The Comparison of Axillary and Rectal Temperatures in Preterm Infants

AUTHORS: Mikyoung Cho1; Yumi Lee2; Euiseok Jung3

AFFILIATIONS: 1 Department of Pediatric Nursing, Asan Medical Center, Seoul, Korea
2 Department of Pediatric Nursing, Asan Medical Center, Seoul, Korea
3 Department of Pediatrics, Asan Medical Center, Seoul, Korea

CONTENT: Accurate monitoring of the body temperature is important for adequate thermoregulation in newborn. The agreement between axillary and rectal measurements for preterm infants has not been established properly. The aim of our study was to evaluate the agreement between axillary temperature (AT) and rectal temperature (RT) measurements in preterm infants.

Preterm infants less than 32 weeks of gestational age (GA) were prospectively included, who were asphyxiated with a score of 3 or less on the 5-minute Apgar score and with major congenital anomalies were excluded, and receiving vasoconstrictors or vasodilators were dropped out of the study. After hemodynamic stabilization, body temperature was measured twice a day from day 1 to day 6. AT and RT were measured using a single type digital thermometer every five minutes, and the order of measurement was randomly determined. Paired T-test was used to analyze the difference between AT and RT at each time point, and the interaction of measurement sites, postnatal days and measurement sites & postnatal days effect was analyzed through linear mixed.

In 80 infants (30; below 28 weeks and 50; 28 to 31 weeks of GA) two paired axillary and rectal measurements were done. The GA varied from 22 to 31 weeks (mean 28 weeks), the birth weight varied from 302 to 1770 g (mean 1025 g). The AT was significantly lower than the RT (mean ± SD 0.18 ± 0.01, p < 0.0001). These results were reaffirmed in two subgroups divided by 28 weeks, regardless of postnatal age. The differences (RT minus AT) increased significantly with increasing RT. AT and RT were poorly agree, though RT can be estimated using AT through a statistical correlation (RT = -4.033 + 1.116*AT). Environmental factors such as incubator temperature and humidity, phototherapy, and the application of invasive mechanical ventilation did not lead to any relation between rectal and axillary measurement differences.

AT measurements cannot be used interchangeably with RT measurements in preterm infants less than 32 weeks.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 540

**TITLE:** The Prevalence and The Risk Factors of Anorectal Malformation in Neonates in Indonesian Population.

**AUTHORS:** Dewi A Wisnumurti 1; Nazardi Oyong 2; Zulfikri 3; Mukhyarjon 4; Dinda Aisyah 5

**AFFILIATIONS:** Neonatology Subdivision, Departement of Pediatric, Arifin Achmad General Hospital, Faculty of Medicine, Universitas Riau, Pekanbaru, Riau, Indonesia

**CONTENT:**
Anorectal malformation (ARM) is a congenital abnormality due to abnormal development of the anus, rectum, and urogenital embryology which is characterized by the absence of anus or an ectopic anal location. The ICBDSR (2014), the incidence of ARM varies in different countries, which is around 0.62–13.00 per 10,000 live births, with greater chance happens in developing countries. It has been reported in 2012 that ARM the most common identified in Riau province, Indonesia. This study aims to determine the prevalence of ARM cases in Arifin Achmad Hospital during 2015–2017, neonatal characteristics, and to assess the magnitude of risk factors for ARM based on data recorded.

The data used in this study is secondary data retrieved from medical records belongs to neonatal care installation and hospital of all neonatal patients admitted to neonatal care installation of Arifin Achmad general hospital from 2015 to 2017 in Pekanbaru, Riau, Indonesia. The search for ARM case data was carried out by purposive sampling based on diagnosis of outpatient. Data were analyzed by cross-sectional analytic using the SPSS program and presented in the form of narratives, tables and graphs.

Of the 2,280 neonatal patients during 2015–2017, 82 patients (3.6%) were diagnosed with ARM, 64.6% were male, 95.1% born outside, 78.1% spontaneous, 61% term, normal birth weight 71.9%, without fistula 68.3%, and high lesion 70.7%. The majority of mothers (58.5%) were in the reproductive age range 20–35 years old and 28.1% of them were >35 years old. As many as 82.9% people were housewives and 56.1% had secondary education. In terms of parity status, 37.8% neonates were the second pregnancy. The cross-sectional analysis of the data showed that gestational age and the birth weight were associated with ARM with the p-value <0.001. However, the maternal age, nutritional status, education, occupation, history of diabetes and hypertension were not associated with ARM. Furthermore, ARM was also not associated with the paternal age, parity status, and neonatal outpatient care condition.

The prevalence of ARM in Riau province, Indonesia was 3.6%. The gestational age and the birth weight of neonates were significantly associated with ARM incidence in this population. The ARM was commonly found in male, full-term, normal birth weight, without fistula, and high lesion. Base on characteristic the mothers of ARM neonates were on reproductive age, housewives, secondary education, and second pregnancy.

**IMAGE / TAB:**

**IMAGE / TAB CAPTION:**

**COI:** None declared
ID: 559

TITLE: 24 HOUR SENIOR MEDICAL PRESENCE ON A TERTIARY NEONATAL UNIT IMPROVES OUTCOMES AND TRAINEE EXPERIENCE

AUTHORS: 1. Ann Hickey
2. Theodore Dassios
3. Anusha Arasu
4. Abhimanu Lall
5. Carolina Zorro
6. Ravindra Bhat

AFFILIATIONS: 1, 2, 3, 4, 5, 6. Neonatal Intensive care Unit, Department of Pediatrics, King's College Hospital, London, UK
1, 2, 9. King's college London, London, UK

CONTENT:
There has been an increasing move towards centralisation of care for premature infants as evidence of improved outcomes is demonstrated. Simultaneously, more non-invasive respiratory care for babies has resulted in fewer opportunities to develop advanced practical skills during early training. However, for the most vulnerable infants personnel with these skills need to be available 24/7 to ensure optimal care and outcomes.

Aim: To demonstrate the benefits of 24 hour senior medical presence on a tertiary UK surgical neonatal unit.

Out of hours cover on a high volume tertiary surgical neonatal unit was rearranged in 2014 to ensure 24 hour presence of a senior trained neonatologist (Final year neonatal trainee or resident consultant). Following the introduction of this resident consultant role, review of mortality data, airway related adverse incidents and trainee satisfaction were reviewed. Data were obtained from BADGERNET (national database) and MBRRACE (national mortality database) and national and local trainee surveys. Adverse Incidents from the hospital risk team were reviewed. Activity was measured by cot days using BAPM (British Association of Perinatal Medicine) 2011 criteria.

Mortality rates for neonatal unit admissions during that time period dropped from 3.6% in 2014 to 1.9% in 2017. In the corresponding period neonatal unit admissions increased from 597 to 735 and activity showed an increase in ITU/HDU days from 7333 days to 8464 days (15% increase) and a reduction in SCBU days from 5636 days to 3952 days. From all surveys, trainees of all grades reported feeling supported and that this enhanced trainee experience. Overall trainee satisfaction initially decreased from 88.0% in 2014 to 72.6% in 2016 and then increased to 91.6% in 2018. Initial trainee apprehension has been replaced by improved confidence and satisfaction. There have been no significant airway related incidents following the change, specifically no failed endotracheal intubations.

We advocate a model with 24 hour senior doctor presence. For trainees this provides a safe and supported environment in which they can develop competences in both decision making and practical skills. Our data demonstrate an association with improved mortality and the elimination of airway related incidents with this model. We suggest that those planning neonatal services consider adopting similar models.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 574
TITLE: UMBILICAL VASCULAR CATHETERIZATION – “TAKE TWO”
AUTHORS: Ferdinand Pulzer 1; Ulrike Wurst 2; Nadine Wolf 3; Matthias Knüpfer 4; Ulrich Thome 5
AFFILIATIONS: Dept. of Neonatology, Universitäts Childrens Hospital, Leipzig, Germany

CONTENT:
Umbilical-vein catheters (UVCs) are used to provide much-needed access for resuscitation, administration of vasopressors and inotropes, fluids and medications, blood transfusion, frequent monitoring of blood, and parenteral nutrition in neonates with unstable condition. In critically ill neonates, several peripheral and/or central vascular lines are necessary. We report on the feasibility of parallel insertion of two multi-lumen UVCs:
After insertion of one multi-lumen UVC, a second catheter ("Umbilical Catheter 3L", 4.5 Fr, Vygon®) is inserted into the umbilical vein in parallel. The correct central position is confirmed by aspiration of blood as well as sonography and/or X-ray. Now, up to 6 available central lines allow the administration of otherwise incompatible fluids, drugs and blood products.

Case 1: Female term newborn 40+4 weeks, 3410g with asphyxia due to heavy vaginal bleeding. APGAR 0/4/6, umbilical artery pH 6.9. Resuscitation with invasive ventilation, 2 UVCs, one umbilical-artery catheter, catecholamines, blood products, drugs, analgosedation. Hypothermia for 3 days. Uncomplicated course.
Case 2: Male preterm neonate 32+6 weeks, 2045g with left diaphragmatic hernia. APGAR 6/7/7, umbilical artery pH 7.02. Invasive ventilation, 2 UVCs, catecholamines, analgosedation, blood products, drugs. Operative closure of the diaphragm gap on the 3rd day of life. Uncomplicated postoperative course.

The parallel insertion of two multi-lumen UVCs is a very efficient alternative to peripheral and/or central venous accesses for simultaneous drug application in newborn emergency situations such as prolonged resuscitation, malformations and hydrops fetalis. Possible disadvantages due to medication incompatibilities can be avoided. UVCs may be associated with complications themselves, and therefore should be handled and monitored carefully.

IMAGE / TAB:
IMAGE / TAB CAPTION:
COI: None declared
ID: 593

TITLE: ASSESSMENT OF NEONATAL GROWTH AND WELLBEING FOLLOWING THYROID HORMONE BASED THERAPY IN A RODENT MODEL OF INTRAUTERINE GROWTH RESTRICTION (IUGR)

AUTHORS: Delphi Kondos-Devic 1; Flora Wong 1; Angela Cumberland 1; Madhavi Khore 1; David Walker 1; Mary Tolcos 1.

AFFILIATIONS: 1Neurodevelopment in Health & Disease Program, School of Health & Biomedical Sciences, RMIT University, Melbourne, Australia. 2 Department of Paediatrics & The Ritchie Centre, Monash Medical Centre, Monash University, Melbourne, Australia.

CONTENT:
We have previously shown that thyroid hormone (TH) transporter - monocarboxylate transporter-8 (MCT8) is decreased in the neonatal IUGR rat brain, perhaps contributing to impaired brain development in IUGR. We also found that administration of the TH analogue, diiodothyropropanoic acid (DITPA), which doesn’t require MCT8 to enter cells, from postnatal day (P) 1-6 promotes myelin recovery by P7. However the preclinical safety profile of DITPA is unknown.

Aims: Here, we determine if DITPA treatment in IUGR rats from P1-13 (equivalent to brain development at 23-40 weeks of gestation in humans) affects neonatal growth and wellbeing.

At day 18 of pregnancy (term = 22 days), rats underwent bilateral uterine vessel ligation (n=29 litters) or sham surgery (n=15 litters) to generate IUGR or control pups. DITPA (0.5mg/100g; i.p.) or saline was administered daily from P1-P13 to IUGR (DITPA n=60; Saline n=57) and control (DITPA, n=42; Saline, n=46) pups. Body weight was measured daily from P1-P14, and brain weight, body composition (via dual-energy x-ray absorptiometry), thyroid function (serum free T3 and T4), serum liver enzymes (alanine transaminase, ALT, alkaline phosphatase, ALP) and cholesterol were assessed at P14.

Body weight was reduced in IUGR pups compared to control at P1 (p<0.0001), P7 (p<0.0001) and P14 (p<0.001). In IUGR pups at P14, there was a reduction in brain weight (p<0.0001), bone content (p<0.0001), bone mass (p<0.001), lean tissue mass (p<0.0001) and fat mass (p<0.001) compared to controls. DITPA did not improve or worsen these effects. In IUGR pups free T4 and ALT were decreased (p<0.01 for both) and ALP was increased (p<0.05) compared to controls. Free T3 and cholesterol were unaffected. In control and IUGR pups, DITPA treatment increased free T3 (p<0.0001), ALT (p<0.01; only in IUGR), and ALP (p<0.05), but reduced free T4 (p<0.0001).

DITPA does not adversely impact neonatal growth or wellbeing following IUGR, despite altering free thyroxine levels and showing hepatic thyromimetic activity.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 606

TITLE: SEIZURES IN PRETERM INFANTS - DIFFICULT TO DETECT AND RELUCTANT TO RESPOND! SPECTRUM AND OUTCOMES IN A SINGLE CENTRE OBSERVATIONAL COHORT STUDY

AUTHORS: Audrienne Sammut 1; Jogesh Kapadia 2; Claudia Chetcuti-Ganado 3.

AFFILIATIONS: Neonatal Intensive Care Unit, Luton & Dunstable University Hospital NHS Foundation Trust, Luton, UK, United Kingdom.

CONTENT:

Neonatal seizures are the most common neurological event in newborns, with a higher prevalence of 10-130/1000 in preterm infants in view of immature central nervous system development, low birth weight and periventricular leukomalacia (PVL) (1) (2). Their higher rates of subclinical seizures as well as their decreased response to treatment with conventional medications makes the management of seizures in this age group highly challenging (2). Seizures thus remain an increasing burden on neurological sequelae and often reflect significant underlying brain injury in the preterm population. We present the spectrum and outcomes from our tertiary neonatal centre.

We retrospectively collected data over a period of nine years (Jan 2010 to March 2019) on infants born between 23 and 36 weeks gestation who had seizures in the neonatal period and were treated in our tertiary neonatal centre. For each infant we extracted data on the underlying seizure aetiology, time to recognition, treatment and investigations performed. Data on outcome was obtained from various sources such as assessment in specialised neurodevelopmental assessment clinics using the Bayley III scales, assessment in regular follow up clinics, and parental questionnaires. As this was an analytical study without any experimental therapeutic intervention, ethical approval was not required.

We identified a total of 65 infants with a median of 28 weeks who had seizures. Median birth weight was 1117g. The median age of onset of seizures was 2 days. The table denotes age of onset and respective aetiologies. 8/19 (42%) with HIE and 14/26 (53%) with IVH died; overall mortality was 48% (32/65), of whom the majority required multiple anti-seizure medications. 4/65 had a metabolic condition, of whom 2 died and the other 2 were discharged with a palliative care plan.

52/65 infants required anti-convulsant therapy; first line of treatment being phenobarbitone in all except 3 cases who received either midazolam or levetiracetam or morphine. Among those who survived, 45% required multiple anti-epileptic drugs to control their seizures.

28/65 (43%) had cerebral function monitoring (CFM) or an electroencephalogram (EEG) performed and 27/65 (41.5%) had magnetic resonance imaging (MRI).

This study sheds light on the diagnostic and management hurdles faced by Neonatologists when confronted with seizures in the preterm infant. Early identification and intervention remain key in reducing mortality and neurological disability. Our unit is focussing on professional education coupled with advancements in neurocritical care, such as video monitoring, early CFM and timely MRIs, to improve long-term outcomes.

IMAGE / TAB:
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=dc5202a40ef882911f109731f3fae8a7-MjAxOS0wNSM1Y2UyNyJyY2E0NWEy

IMAGE / TAB CAPTION: Box plots showing age at onset of seizures (log10 days) stratified by intracranial pathology. p values for statistically significant comparisons are depicted at the top of the graph (statistical significance defined as p < 0.05, Wilcoxon rank sum test).

COI: None declared
ID: 614

**TITLE:** REFRACORY EPILEPSY IN NEWBORN-A THERAPEUTIC CHALLENGE

**AUTHORS:** Joana Grenha1, Mariana Capela1, Joana Silva1, Joana Reis1, Teresa Torres1, Márcia Gonçalves1, Andreia Teles1, Fátima Santos2, Alexandre Rainha Campos 3

**AFFILIATIONS:**
1 – Neonatal Unit, Paediatric Department. Centro Hospitalar Vila Nova de Gaia/ Espinho, Portugal
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3 - Neurosurgery, Hospital de Santa Maria - Centro Hospitalar Universitário Lisboa Norte, Portugal

**CONTENT:**
Identifying the etiology is a primary clinical objective in the management of neonatal seizures, which can lead to etiology-specific therapy and may limit central nervous system dysfunction. Cortical dysplasia is a congenital abnormality with high propensity to cause refractory epilepsy and is the most common reason to require an epilepsy surgery. Early surgical intervention in children with cortical dysplasia and intractable seizures in infancy can yield favorable seizure outcome, although younger children often need extensive surgical procedures.

We report a case of a patient admitted in the neonatal intensive care unit at birth for neonatal history of isolated ventricular extrasystoles detected at 36 weeks’ ultrasonography. The baby was a second born in non-consanguineous marriage. The mother had suffer 2 miscarriages in the first trimester one year before the actual pregnancy. She had a MTHFR homozygous mutation plus a PAI heterozygous one. It was a full term male vacuum extractor delivery with birth weight of 2645g (<3rd percentile) and one-minute and 5 minute APGAR scores of 9 and 10, respectively. On examination the vital signs were normal. Cardiac auscultation showed rhythmic heart sounds without murmurs. The cardiac monitoring show no arrhythmias. In day one of life the baby had a generalized tonic-clonic seizure that stopped with a 20mg per kg dose of phenobarbital. Sepsis workup was normal. The CT scan showed a small occipital fracture and a small subdural bleeding. On day four of life he started seizing again, with different types of seizures: clonic, tonic, partial and generalized ones. The aEEG monitoring revealed a normal background pattern with sleep-awake cycles but also dozens of daily seizures. He started on phenobarbital with poor response. On day 5 he performed a cerebral MRI that revealed a suspicious area for cortical dysplasia in the left insular area. He was under several types of anti epileptic drugs: phenobarbital, levetiracetam, phentoin, topiramate, clonazepan, carbamazepin, midazolam, dexamethasone, lidocaine, sodium valproate, vigabatrin and ketogenic diet. Metabolic workup, neurotransmitters study and arrays were normal. He was transferred to an epilepsy surgery center at day 54. He was submitted to surgery at day 65 and a lesion with 5mm was removed. The pathological anatomy confirmed an area of cortical dysplasia. After surgery the EEG was almost normal, with no seizure activity. He maintained 3 anti epileptic drugs and was re-transferred to our hospital 10 days after surgery. He had no seizures for two weeks but at this time he started with fever, seizures, emesis and abdominal distention. The x-ray was compatible with intestinal occlusion and urgent surgery was performed, with resection of 6 cm of descendent colon and a colostomy. The pathological anatomy was compatible with a stenotic area, probably due to a previous infectious complication. After this surgery he continued to have daily brief seizures: tonic generalized and right clonic partial ones. He is now 4 months old. He is under anti epileptic treatment and another MRI is already scheduled. From a neurological perspective, he is an apparently healthy boy, with good social contact, generalized hypotonia but harmonious and symmetric movements. He has an important muscular atrophy but he is improving with physiotherapy and occupational therapy.

cortical dysplasia is a rare cause of newborn seizures. Cases with unresponsive epilepsy should performed an MRI to exclude or confirm cortical malformations. Although epilepsy surgery is rarely performed under six months of age, this case is an example of a successful one.

**IMAGE / TAB:**

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COI: None declare
ID: 617
TITLE: Administration roles within a Quality Improvement project.
AUTHORS: Jennie Barrett; Raducu Clapuci; Rahul Roy
AFFILIATIONS: Neonatal Intensive Care Unit
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CONTENT:
In June 2017, the Norfolk and Norwich University hospital became involved with the ATAIN (Avoiding Term Admissions in NICU) project looking at our number of term admissions and how they could be reduced. This is a project that many other Neonatal Units have been involved in but each unit have found their own way to manage the project. Our project is led by a Neonatal Consultant and a Data Administrator. It is unusual to have someone in an Admin role lead on a project like this. The role of Admin staff is often overlooked within a clinical setting however, admin staffs are the backbone of all units ensuring the smooth running and functioning of the unit.

Inclusion criteria of which term babies will be reviewed was agreed at the outset. Fortnightly review meetings were held to review the clinical notes of mother and baby. These meetings were attended by a Neonatologist, NICU nurse, Midwife, Obstetrician and Data Administrator. The Data Administrator created forms with set questions regarding the mother and baby’s care so to establish if the admission was warranted and if anything could been done differently, created a spreadsheet to record all term admissions and reason for admission, captured data from the meetings on the spreadsheet, ensured correct attendees were at each meeting, captured actions and ensured completion, analysed results, presented conclusions and ensured that timelines were followed and the audit completed.

Number of term admissions has dropped by 3% within 1 year. New guideline was introduced to guide management of a mother with pyrexia in labour versus pyrexia due to sepsis. Only babies of mothers who are treated for sepsis need to receive antibiotics. We introduced a sticker that has prompts regarding the clinical or risk factors that the patient has to ensure antibiotics were the appropriate course of action. It also includes a section for reviews after 24 hours and what the next course of action would be following those results so that antibiotics were stopped in a timely way. The audit is continuing and we are confident that we will continue to reduce the number of term admission to NICU.

The Data Administrator has been pivotal in orchestrating the audit. The real success of our project has been down to the organisation, dedication and adaptability that the Data Administrator has shown to ensure the project delivered on its goals. The clinical staff input was limited allowing them to carry out other clinical duties. Admin staffs are a vital cog in the Neonatal team. Respect them and involve them, they want to help.

IMAGE / TAB:
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=935a10a3a1d09c5ed18d7e531850122d-MjAxOS0wNSM1Y2UyNjY2Y2E3ZDI1

IMAGE / TAB CAPTION: Table of comparison of NICU admissions pre and post ATAIN Project

COI: Non declared
ID: 620

**TITLE:** Establishing the Incidence Rate of Early Onset Neonatal Sepsis for Kaiser Permanente Sepsis Calculator, A Retrospective Study.

**AUTHORS:** Hannah Hagan 1; Olha Danko 2; Wisam Muhsen 3

**AFFILIATIONS:** Neonatal Intensive Care, University Hospitals Plymouth, Devon, UK

**CONTENT:**

Infection is a significant comorbidity in the neonatal population. In developed countries, the mortality from Early Onset Neonatal Sepsis (EONS) is estimated at 11%, with morbidity over 6%. EONS is defined as a positive bacterial blood or CSF culture, within the first 72 hours in babies weighing less than 1500g, or within the first week in other babies.

In 2012 in the UK a guideline on EONS was introduced. However, this led to more screening and concerns about over investigation and overuse of antibiotics. The Kaiser Permanente Sepsis Calculator (KPSC) was developed to aid management of babies at risk of EONS. The KPSC uses the local EONS incidence in the calculation.

This retrospective study looked at all positive isolates on babies within the first 28 days of life over a three-year period (2015, 2016 & 2017) for the babies who were under the care of the neonatal team at Derriford Hospital, Plymouth during this period. Any samples that did not fulfil the definition of EONS, were recognized as contamination, had the same sample reported more than once, or were for out-born neonates were excluded.

The total number of the live births at the maternity unit at Derriford Hospital, Plymouth was established through the delivery suit data for these three years.

Badger-net database, medical e-notes and also actual paper-based medical notes were used to collect the data.

There were 185 isolates in total, of which 115 did not meet the criteria for early onset sepsis. A further 18 cultures were repeat cultures and 37 were contaminants. Further 3 exclusions as the babies were out-born. This is summarised in figure 1.

In total we identified 12 cultures that fulfilled the definition of early onset neonatal sepsis in babies who were born at ≥ 34/40 gestation, in comparison to 13006 live births during that time. This equates to a total incidence of 0.9 per 1000 births.

Establishing the incidence of EONS is vital when incorporating KPSC into clinical practice. Certainly, some patients had escalation in their management when the EONS incidence increased from 0.6 to 0.9 per 1000 births; starting antibiotics might be recommended in certain cases rather than observation only. Hence, this study recommends the establishment of the local EONS incidence rate for any neonatal team incorporating KPSC in their practice.

**IMAGE / TAB:**
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**IMAGE / TAB CAPTION:**

**COI:** None declared
ID: 625

TITLE: PAIN IN EARLY LIFE (PEARL) – A NETWORK FOR PAIN RESEARCH AND EDUCATION

AUTHORS: Anna Axelin 1, Randi Dovland Andersen 2, Mats Eriksson 3, Guðrún Kristjánssdóttir 4, Janne Weis 5

AFFILIATIONS: 1 Department of Nursing Science, University of Turku, Turku, Finland, 2 Department of Research, Telemark Hospital, Skien, Norway, 3 Faculty of Medicine and Health, School of Health Sciences, Örebro University, Örebro, Sweden, 4 School of Health Sciences, Faculty of Nursing, University of Iceland, Reykjavik, Iceland, 5 Department of Neonatology, Copenhagen University Hospital, Copenhagen, Denmark.

CONTENT:
Small children are especially vulnerable to the deleterious effects of pain. High quality research is needed to protect young children from the negative effects of pain. Previously pediatric pain research in the Nordic region was severely limited; hampered by small samples and small-scale, time-consuming studies carried out by a few dedicated researchers. The similarities across the Nordic countries, concerning population composition, healthcare systems, and culture, made it reasonable to join forces for advances in child pain research and evidence-based practice.

In 2014, a group of Nordic researchers from the field of pain in early life gathered for a workshop in Örebro, Sweden. The participants knew each other from conferences or participation in common projects. Several were also collaborators, trainees, or alumni in the Canadian Pain in Child Health (PICH) network. The group decided to form a new network with the vision: To be a stable and competent research and training network within the area of pain in early life. The network was named PEARL – Pain in EARly Life. Three areas of work were defined: to provide parents with evidence-based information on pain relieving strategies, to provide healthcare professionals with evidence-based tools for the management of pain, and to perform collaborative research.

Since then, PEARL has held yearly lecture days about pain in early life in Sweden, Norway, Finland and Denmark and thereby reached hundreds of clinicians. The meeting in Denmark was organized together with PICH as a PICH2Go-event with participants from 13 countries around the world. Four trainees have been awarded their PhD-degree, three members have become associate professors and two have become full professors. In all, 24 persons from the Nordic countries, Poland and Canada are members of PEARL. In the past 5 years, researchers from PEARL have published 94 papers about pain and stress (Fig 1). In a collaborative project, the pain assessment scale PIPP-R has been translated and culturally adapted for four Nordic languages. PEARL has established a website in six languages, with sections for parents, professionals and researchers: www.pearl.direct.

In five years, PEARL has had significant impact in pediatric pain research and attracted new collaborators and students. Moving forward, PEARL will focus on increasing its collaboration with other research groups. We will also make an effort to strengthen and develop parent partnerships and collaboration to ensure the best research and care possible for vulnerable small children.

IMAGE / TAB:
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=730f3f66d7298ddcdd6ef0bf7d5ce5e2-MjAxOS0wNSM1Y2UyNjY2Y2FhYW13

IMAGE / TAB CAPTION: Fig 1. Accumulated pain and stress publications from researchers in the PEARL network.

COI: None declared
ID: 638  
**TITLE:** Early Extubation Success in Extremely Preterm Infants – A tertiary neonatal unit experience  
**AUTHORS:** Dr Amelia Shaw 1  
Dr Aishin Lok 2  
**AFFILIATIONS:** 1 Neonatal Unit, Leeds General Infirmary, Leeds Teaching Hospitals NHS Trust, Leeds, West Yorkshire, UK  
2 Neonatal Unit, Bradford Royal Infirmary, Bradford Teaching Hospitals NHS Foundation Trust, Bradford, West Yorkshire, UK  

**CONTENT:**  
It remains common in the United Kingdom for the majority of extremely preterm infants to require mechanical ventilation after birth. Prolonged ventilation is associated with higher incidences of chronic lung disease, intracranial haemorrhage and mortality. It also leads to worse neurodevelopmental outcome. Currently, there is no single measure to direct the decision when to extubate and no consensus guidance exists. This study aimed to explore extubation practices in the extremely preterm or extremely low birth weight (ELBW) infants and identify clinical strategies which may influence successful extubation. Composite outcome of mortality and predefined major morbidities were also assessed.  

A retrospective study was conducted of extremely preterm infants (less than 27 weeks gestational age) or ELBW infants (birth weight less than 1000 grams) admitted to a tertiary neonatal intensive care unit and requiring mechanical ventilation at birth from January 1st to December 31st 2016. Successful extubation was defined as a period of 72 hours or more without needing re-intubation. Data was gathered from BadgerNet, medical case note review and K2 medical systems.  

58.8% infants were extubated within the first 72 hours of life with more than a third requiring mechanical ventilation for over a week. 35.7% achieved successful extubation. A quarter of extremely preterm or ELBW infants only required one episode of mechanical ventilation between birth and discharge home. Earlier extubation did not lead to an increase in major morbidity. It was also not associated with a higher rate of extubation success. As expected, those of a more mature gestation and higher birthweight were more likely to not require re-intubation. Extubation failure was associated with use of sedation, incomplete antenatal steroids and low haemoglobin levels. Higher rates of significant intraventricular haemorrhage and bloodstream infection were seen in infants who failed extubation.  

Early extubation is feasible in the extremely preterm population if pre-extubation conditions are optimised. Findings from this study have contributed towards changing current practice and the extubation checklist will be modified. A regional review of extubation practices is underway with the aim of establishing a network guideline.  

**IMAGE / TAB:**  

**IMAGE / TAB CAPTION:**  

**COI:** None declared
TITLE: ANALYSIS OF RISK FACTORS FOR IMPAIRMENT OF THE NEUROPSYCHOMOTOR DEVELOPMENT OF EXTREME PRETERM INFANTS IN A DEVELOPING COUNTRY

AUTHORS: Fábia Pereira Martins Celini1, Angela Filomena Devito1, Carlos Juliano Martins Celini2, Camilla Martins Celini3, Davi Casale Aragon1, Walusa Assad Gonçalves Ferri1.

AFFILIATIONS: 1Department of Pediatrics, Ribeirão Preto School of Medicine, University of São Paulo, Ribeirão Preto, São Paulo, Brazil; 2Graduation at University Center Barão de Mauá, Ribeirão Preto, São Paulo, Brazil; 3Graduation at University of Ribeirão Preto, UNAERP, São Paulo, Brazil.

CONTENT:
Advances in perinatal and neonatal care have increased the survival of extreme preterm infants with lower morbidity and mortality. The world literature has shown varied indices regarding the frequency and degree of neurological impairment of extreme preterm infants. Studies in developing countries on this topic are needed. The objective of this study was to analyze the frequency of occurrence and risk factors for impairment of neuropsychomotor development (NPMD) of extreme preterm infants.

Retrospective study. Included preterm infants born in a tertiary hospital between January and December 2016, with gestational age (GA) at birth between 23 and 28 weeks. Included newborns who did not die during hospitalization and with follow-up until December 2018. Excluded malformations, genetic syndromes, cardiac defects and lack of data. Considered impairment of NPMD any type of motor deficit and/or language/speech and/or swallowing and severity was determined by the DENVER II test and according to follow-up performed by multidisciplinary team. Group 1: without neurological impairment; Group 2: mild/moderate impairment; Group 3: severe impairment with cerebral palsy or severe impairment of speech/swallowing.

Fisher's exact and non-parametric Kruskall-Wallis tests were used for analysis.

Selected 29 patients, excluded 4 and completed the study 25 newborns. Group 1: 6(24%) patients, Group 2: 7(28%) and Group 3: 12(48%). Group 1 presented significantly higher mean GA at birth (p = 0.04). Among children with GA between 27-28 weeks, 9(81.8%) evolved without or with mild/moderate impairment and 2(18.2%) with severe NPMD deficit. Those with 25-26 weeks, 8(72.7%) progressed without or with mild/moderate impairment and 3(27.3%) with severe delay. Those with 23-24 weeks, 2(66.7%) presented mild/moderate impairment and 1(33.3%) severe NPMD impairment. There wasn’t association between neurological impairment and gender, type of delivery, Apgar 5th minute, need for resuscitation, hypothermia, SNAPPE II>20, antenatal use of magnesium sulfate and corticosteroids, early sepsis, perinatal intraventricular hemorrhage and association with hemodynamic instability was observed (Table 1).

The rate of neurological impairment of premature infants born was similar to that observed in other good services. Antenatal and postnatal intervention measures are important in order to maintain hemodynamic stability. Analyzes with larger numbers of patients considering the death rates are necessary to confirm these findings.

IMAGE/TAB:
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IMAGE/TAB CAPTION: *PIVH: perinatal intraventricular hemorrhage

COI: None declared
ID: 647

TITLE: FACTORS ASSOCIATED WITH NEONATAL HYPOTHERMIA OF VERY LOW BIRTH WEIGHT PRETERM INFANTS AT ADMISSION TO A NEONATAL INTENSIVE CARE UNIT

AUTHORS: Fábia Pereira Martins-Celini1, Guilherme Vilela Gomide Barreira1, Camilla Martins Celini2, Carlos Juliano Martins Celini3, Davi Casale Aragon1, Walusa Assad Gonçalves-Ferri1.

AFFILIATIONS: 1Department of Pediatrics, Ribeirão Preto School of Medicine, University of São Paulo, Ribeirão Preto, São Paulo, Brazil; 2Graduation at University of Ribeirão Preto, Ribeirão Preto, São Paulo, Brazil; 3Graduation at University Center Barão de Mauá, Ribeirão Preto, São Paulo, Brazil.

CONTENT:
Despite the recommendation of measures to minimize the occurrence of hypothermia, its prevalence is still high in neonates with very low birth weight (VLBW) and associated with increased neonatal mortality. Studies analyzing the association between hypothermia in VLBW infants and use of anesthetic drugs by the mother, maternal hypothermia and other risk factors are necessary. The objective of this study was to analyze the impact of maternal anesthesia/analgesia, maternal hypothermia and other risk factors on temperature of preterm VLBW admitted with hypothermia to the neonatal intensive care unit (NICU).

Retrospective study. Preterm infants <1500 grams born in a tertiary hospital between January and December 2017 with hypothermia (axillary temperature 37.5˚C), malformations, genetic syndromes and lack of data. Maternal temperature was measured with digital thermometer, intrapartum or up to 1 hour postpartum. Axillary temperature of the newborn was obtained with digital thermometer after birth, immediately prior to transport and at NICU admission. Frequency of occurrence and averages with their standard deviations were calculated. Relative risks (RR) for the occurrence of pretransport hypothermia were calculated by adjusting log-binomial regression models.

Included 38 newborns with mean gestational age and birth weight respectively 26.1 weeks and 855.5 grams. Twenty-five children (65.8%) were diagnosed with early sepsis, 15 (39.5%) required vasoactive drugs in the first 24 hours of life and 71% (27) were hypothermic before transport to NICU. The mean maternal age was 26.6 years old, 22 (57.9%) received anesthesia/analgesia and 45.8% were hypothermic at the time of delivery. No increased risk of hypothermia was observed with type of delivery ([RR= 1.11 (0.73; 1.71)], occurrence of early sepsis (RR= 0.83 (0.57; 1.21)), use of vasoactive drugs (RR= 1.24 (0.86; 1.79)), temperature <23˚C in delivery room (RR=0.89 (0.39; 2.03)), maternal anesthesia (RR= 1.02 (0.69; 1.52)) and maternal hypothermia (RR= 1.00 (0.6; 1.67)) even when this last two analyses were adjusted for the temperature of the delivery room and type of delivery (Table 1).

No association was observed between antenatal maternal anesthesia, analgesia or hypothermia and other risk factors (type of delivery, early sepsis, use of vasoactive drugs, temperature < 23˚C in delivery room) with hypothermia of preterm VLBW on admission to the NICU. Thermal control of prematurity remains a challenge and further studies are needed to identify risk factors in order to reduce the incidence of this morbidity.

IMAGE / TAB:
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=c3ea3150ca924799ad22c51caa7ae03-MjAxOS0wNSM1Y2UyNjY2Y2lwiZWE2

IMAGE / TAB CAPTION: *RRadj (CI95%): Relative Risk with 95% confidence interval, adjusted for delivery room temperature and type of delivery.

COI: None declared.
ID: 654
TITLE: GROUP B STREPTOCOCCAL LATE-ONSET NEONATAL SEPSIS IN TWINS
AUTHORS: Alenka Stepišnik; Irena Cetin Lovšin
AFFILIATIONS: Paediatric Dept., General Hospital Izola, Izola, Slovenia

CONTENT:
Group B Streptococcus (GBS) is the leading cause of neonatal sepsis in developed countries. Only a few cases of late-onset neonatal sepsis in twins are described in literature, most often in premature ones. Origin of late-onset infection is not entirely clear; latest reports strongly suggest enteral mode of transmission from infected breast milk.

We present a case of dizygotic male twins, (gestational age 35 weeks; birth weights: 2070 g and 2050 g), who were born after induction of vaginal labor due to hepatopathy of 28-year old primigravida. Antenatal vaginal swabs were not taken and she received no peripartal antibiotic. External ear canal swab taken from twin B grew GBS, otherwise the postnatal period of both was completely uneventful.

On the thirteenth day after birth, twin A vomited once and refused further feedings. During the night he became febrile -39°C and was brought to our hospital in the morning. At admission, he was hypotonic, hypoglycemic and poorly responsive with prolonged capillary refill. Intensive therapy with boluses of fluid, glucose solutions, antibiotic therapy, bicarbonate, vasopressor infusion and artificial ventilation slightly improved his condition. Afterwards short bradycardic periods started to appear that were responsive to short term reanimation. He was transported to intensive care unit, where he died a few hours after arrival, after prolonged reanimation. Blood cultures (BC) grew GBS.

The same day his brother, twin B, was admitted for anticipated preventive parenteral antibiotic treatment. At admission, he was clinically stable with a bit poorer weight gain. Parameters of infection were low. BC were taken and were also GBS positive. The same pathogen was isolated from the breast milk too. With penicillin treatment his weight gain markedly improved and with treatment both – boys and mothers microbiological cultures became sterile.

Late-onset neonatal sepsis is a life threatening condition. As the pathogenesis of the disease is not fully understood, there are no effective preventive strategies. Prematurity is an important risk factor, therefore special warning should be given to their parents before discharge from hospital. In the rare cases of GBS sepsis in one of the twins, the other should be promptly evaluated for the possible infection.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 656
TITLE: PERINATAL STROKE IN A FULL-TERM NEONATE
AUTHORS: Maria Tsirigotaki 1, Maria Raissaki 2, Nicole-Hilda Anagnostatou 1, Olga Michopoulou 1, Pelagia Vorgia 3, Eleftheria Hatzidaki 1
AFFILIATIONS: 1Department of Neonatology, Neonatal Intensive Care Unit
2Department of Radiology
3Department of Paediatrics, University Hospital of Heraklion, Crete

CONTENT:
Perinatal stroke is an acute neurologic syndrome of vascular origin with an incidence of 13/100,000 births. Cerebral venous thrombosis is a rare and multifactorial cause of perinatal stroke. We report a case of cerebral sinovenous thrombosis (CSVT) in a term female infant admitted with late-onset sepsis and meningitis by Group b Streptococcus (GBS).

A 12-day-old female born at 38 weeks gestation by caesarian section presented with a history of inconsolable crying, poor feeding and fever up to 38°C. Uneventful maternal antenatal history apart from insulin-dependent gestational diabetes mellitus. Pregnancy and delivery were uncomplicated. On examination, she was febrile, grunting with prolonged capillary refill time and bulging fontanel. She was started on antibiotic empirical intravenous treatment. Her blood cell count demonstrated a white blood cell (WBC) count of 4500/mm³, CRP was 15.73 mg/dl. Lumbar puncture revealed 1810 leukocytes with marked neutrophilia, low CSF glucose of 1 mg/dl and raised protein. Blood and CSF cultures grew GBS 12 hours later. Initial cranial ultrasound was normal. On day one, clonic seizures of the right arm were noted, irregular breathing and episodes of apnea. Portable Ultrasonography disclosed echogenic swollen gyri at the left parasagittal region and significant hyperechogenicity covering the surface of the brain, in keeping with complicated meningitis. A 2-mm echogenic lesion at the sinus confluence was moderately suspicious for early thrombosis. Computed tomography showed the extent of multiple hypodense lesions in cortical and subcortical white matter of the left frontal, parietal and occipital lobes and right frontal lobe anterior to the central sulcus. Magnetic resonance imaging (MRI) and venography (MRV) of the brain 2 days later confirmed multiple cortical ischemic lesions, bilateral subdural empyema and extensive thrombosis of the superior sagittal sinus, right transverse sinus and of bridging veins. EEG findings were at first compatible with neuroimaging findings but gradually resolved. Blood and CSF cultures repeated on day three of hospitalization were sterile. She was commenced on low molecular weight heparin. Thrombophilia screening was negative. MRI, MRV imaging were repeated 8 weeks later showing resolution of the thrombosis and residual porencephalic cortical areas. She completed an 8-week course of antibiotics treatment without need for anti-convulsant medication on discharge. The neurological evaluation on discharge revealed global hypotonia. Early rehabilitation was started with physiotherapy and close follow up was organized.

GBS sepsis can be a rare cause of CSVT in neonates. Magnetic resonance imaging is the preferred brain imaging modality in suspected perinatal stroke and when used with MRV increases the sensitivity to detect venous and sinus thrombosis. Early diagnosis can lead to prompt therapy and improve neurodevelopmental outcome.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 661

TITLE: INVASIVE INFECTION DUE TO CANDIDA PARAPSILOSIS WITH HEPATIC INVOLVEMENT IN A VLBW INFANT.

AUTHORS: Rozeta Sokou, Aikaterini Konstantinidi, George Patsouras, George Katsaras, Evaggelia Tavoulari, Konstantinos Adamopoulos, Konstantina Skordili, Elina Isaakidou.

AFFILIATIONS: NICU, Nikaia General Hospital “Agios Panteleimon”, Piraeus, Greece

CONTENT:
Candida infections have emerged as an important cause of morbidity and mortality in NICUs, especially in VLBW and ELBW infants, often involving invasive focal infections of CNS, kidneys and other organs. Early diagnosis and treatment (even empiric) is crucial, resulting in better outcome. Especially, neonatal fungal hepatic involvement is rare, and in medical literature very few case reports are published. We report a case of neonatal systemic candidiasis with CNS, kidney and liver involvement, which responded to conservative management with systematic antibiotics.

A male preterm neonate born at 29 weeks to a secundigravida mother by caesarean section, with birth weight 1250 gram, was treated for late onset sepsis (LOS) caused by Klebsiella pneumoniae with meropenem and amikacin. At 11-days-of-life, its clinical status suddenly appeared deteriorated with clinical signs and laboratory findings of DIC, acute renal failure, liver dysfunction and CNS involvement presenting with hypoglycorrhachia. The blood culture was positive for Candida Parapsilosis, hence amphotericin B and micafungin therapy was added. At 37 days of life, because of the ongoing fungal systemic infection and liver dysfunction, a repeated abdominal ultrasound was performed revealing two echogenic focal areas in the gallbladder and multiple echogenic areas in both kidneys. Systemic antifungal therapy was withheld after 70 days, where no signs or clinical findings of infection and organ dysfunction were present. At the prescheduled follow up appointment of 3 and 6 months, both growth and neurodevelopmental outcome were normal for his age.

Diagnosis and treatment of fungal infection in the NICU’s are challenging. Ultrasound examination of the brain, heart, abdomen should be performed in all suspected cases of invasive focal candidiasis. Prompt diagnosis of candidemia and initiation of antifungal therapy are crucial to survival in infants and especially in VLBW neonates.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 663

TITLE: OCHROBACTRUM ANTHROPI: A RARE CAUSE OF LATE-ONSET SEPSIS IN A PRETERM NEONATE.

AUTHORS: Aikaterini Konstantinidi, Rozeta Sokou, George Katsaras, Konstantinos Adamopoulos, George Ioakeimidis, Georgia Petropoulou, Stavroula Parastatidou.

AFFILIATIONS: NICU, Nikaia General Hospital “Agios Panteleimon”, Piraeus, Greece

CONTENT:
Ochrobactrum anthropi, also known as Achromobacter species (CDC group Vd), is a gram-negative aerobic bacillus, part of the intestinal flora, potentially pathogenic in immunocompromised patients especially those with indwelling catheters and other medical devices or with intestinal obstruction. It is a multidrug resistant bacterium, sensitive to aminoglycosides, carbapenems and quinolones. It shows phenotypic similarities to other pathogens (Pseudomonas spp), which makes it difficult to identify. Few cases of late-onset sepsis have been reported in neonates with congenital abnormalities. We present a case of a premature infant with late-onset sepsis due to O. anthropi.

A female neonate of 35w GA and 2650gr was born by a primigravida mother (refugee from hot spot), with high Apgar score and transferred to our NICU because of prematurity and respiratory distress. Total parenteral nutrition and therapy with ampicillin and gentamycin were initiated because of abdominal dilatation and bilious gastric residuals. The 5th day of life the neonate presented septicemia and the antibiotic therapy was modified to teicoplanin, amikacin and piperacillin-tazobactam. O. anthropi was isolated from blood culture, susceptible to amikacin (MIC 8), ciprofloxacin (MIC<0.25), meropenem (MIC 0.5) and resistant to all beta-lactams. Based on the antibiogram, meropenem and amikacin were administered for 10 days. The newborn’s clinical condition progressively improved. His psychomotor development was assessed at the follow up appointments at 3 and 6 months and was appropriate for his age.

O. anthropi is a rare cause of bacteremia, affecting primarily patients with immunosuppressive conditions - such as preterm infants, and leading to early/late onset sepsis. Given its robust antibiotic resistance and the difficulty in identifying it, empirical antibiotic regimens, especially those including β-lactams, should be administered with caution to premature infants when there is a great suspicion of sepsis due to Gram negative bacterium.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 664

TITLE: THE INVESTIGATION OF THE RISK FACTOR OF INTENSIVE CARE PATIENTS WHO FAILS IN NATIONAL HEARING SCREENING TEST

AUTHORS: Melda Taş1, Canan Türkyılmaz1, Yusuf Kemal Kemaloğlu2, Gözde Bayramoğlu2, Münevver Baş1, Elif Keleş1, Aytaç Kenar1, Başak Gürsoy1, Ibrahim Murat Hırfanoğlu1, Esra Eray Önal1, Ebru Ergenekon1, Esin Koç1

AFFILIATIONS: 1 Department of Pediatrics, Division of Neonatology, Gazi University Hospital, Ankara, Turkey. 2 Department of Otolaryngology, Gazi University Hospital, Ankara, Turkey.

CONTENT:
Congenital hearing loss in healthy newborns varies between 0.1-0.6%. The importance of early detection and treatment of congenital hearing loss within the first 6 months has been emphasized and it has been shown that patients who had early intervention in the language tests had the same social and cognitive success as normal children. The application of the national hearing screening test in newborn intensive care units is becoming more important in terms of the patients’ risk.

The study included 881 patients followed-up in the Newborn Unit of Gazi University in January 2016-December 2017 and the patients who failed the second ABR test were taken and evaluated according to the 1994 JCIH recommendations in terms of their risk factors that (1) Family history, (2) intrauterine infection (TORCH's), (3) craniofacial anomalies, (4) birth weight <1500 g, (5) indirect hyperbilirubinemia requiring blood exchange, (6) Use of ototoxic drugs, (7) bacterial meningitis, (8) Apgar score 5 days mechanical ventilation, (10) Signs of syndromes associated with sensorineural and/or conductive hearing loss. Patients were also investigated for possible factors like HFO ventilation, surfactant administration, pulmonary hypertension, ROP, the presence of smoking in the mother.

In our newborn unit, 881 patients were hospitalized in 2016-2017 and ABR test was applied to all newborns. The first test fail ratio was 24 (2.7%). Three out of 10 patients (0.34%) had bilateral or unilateral permanent hearing loss. A patient with persistent hearing loss had Down's syndrome and had risk factors such as 0/5 APGAR, <1500 g weight, long mechanical ventilation, and surfactant use and ototoxic drug use. One patient with bilateral hearing loss received hypothermia due to HIE. The other patient received hypothermia treatment due to HIE. This patient also had a history of ototoxic drug use and his physical examination revealed cleft palate-lip. One patient had left parietal fracture trauma and CMV infection, three patients had prolonged mechanical ventilation, and two patients had cleft palate-lip, but these patients did not show permanent sensorineural hearing loss.

If the neonatal hearing scan is delayed, the acquisition of basic language, social and cognitive skills becomes difficult. The statistical rate of the patients who had permanent hearing damage was consistent with the literature. HFO application, surfactant administration, pulmonary hypertension and ROP have been tried to be associated with risk factors, but sufficient data could not be obtained.

IMAGE/TAB:

IMAGE/TAB CAPTION:

COI: None declared
ID: 666
TITLE: SMOKING AND FAMILY STATUS OF EXPECTANT MOTHERS IN RELATION TO THE HUMAN DEVELOPMENT INDEX (HDI).
AUTHORS: Aikaterini Konstantinidi, Rozeta Sokou, Konstantinos Adamopoulos, Evaggelia Tavouliari, Petroula Georgiadou, Eirini Moschari, Konstantinos Mitropoulos.
AFFILIATIONS: NICU, Nikaia General Hospital “Agios Panteleimon”, Piraeus, Greece

CONTENT:
The detrimental effects of smoking during pregnancy are well known, and they have been identified with risk of miscarriage, premature labor, growth retardation, SIDS, as well as postpartum with tertiary smoking, where smoke remains in the hair and clothing of the mother to which the baby is exposed. According to the latest update by the WHO (2017), smoke leads half its users to death, being responsible for the deaths of 7 million people each year while about 80% of smokers live in low and middle income countries. We aimed to investigate whether the Human Development Index (HDI) of the country from which the expectant mother comes from, relates to smoking and marital status.

The sum of expectant mothers, including both native population and foreigners recorded in our maternity ward, was studied during the years 2015 and 2016. An assessment was then made of the percentage of the expectant mothers who smoked in relation to the home country's HDI (an additional category of Roma Greek expectant mothers was recorded as group 0) as well as the percentage in the same sample of expectant mothers who were married in relation to HDI.

A total of 797 expectant mothers were studied. It was observed that as the HDI of the country of origin of the expectant mothers rises, there is also a rise in the incidence of smoking, to a statistically significant extent (p = 0.000). In the parallel study in the same sample on the marital status expectant mothers, it was found that as the socio-economic level of the country of origin of the expectant mother (HDI) increases, a higher proportion of unmarried expectant mothers to a statistically significant extent (p = 0.000) was observed.

In the sample studied at our hospital, it appeared that factors that need to be studied more differentiate the effects on HDI and smoking relative to WHO data. Noteworthy are the findings in the Roma Greek expectant mothers who presented with higher rates both in smoking and in the percentage of unmarried women due to different lifestyles and customs.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 667

TITLE: THE EFFECT OF THE HUMAN DEVELOPMENT INDEX (HDI) AND IMMIGRATION ON THE CHOICE OF DELIVERY MODE.

AUTHORS: Rozeta Sokou, Aikaterini Konstantinidi, Konstantinos Adamopoulos, Stavroula Parastatidou, George Ioakeimidis, Dimitra Vallianou, Stelios Sotirakos.

AFFILIATIONS: NICU, Nikaia General Hospital “Agios Panteleimon”, Piraeus, Greece

CONTENT:
The difference in the type of delivery among immigrant and indigenous expectant mothers according to the international literature suggests that non-medical factors, such as lack of information-support during pregnancy and "care" practices during childbirth related to the cultural or religious background, can inhibit the practice of vaginal delivery. We aimed to investigate the potential impact of the Human Development Index (HDI) and immigration on the choice of the type of delivery.

All births, birth rates via C-section, and C-section indications in our maternity clinic were recorded for the period from December 2014 to December 2016. The analysis was performed for each parameter on Greek citizens, Roma Greek citizens and foreign expectant mothers according to the classification of countries of origin based on the Human Development Index (HDI) of the United Nations Development Program (UNDP).

A significantly higher birth rate with vaginal birth (71.2%) was found among Roma Greek citizens compared to all other study groups, probably due to the cultural perceptions of this population. Among the expectant mothers from countries classified as HDI-1 countries, 51.4% of them underwent C-section, with 14.1% of them with no actual medical reason. In the HDI-3 group, in which women from refugee camps are included, the birth rate of vaginal delivery was the same as that of births via C-section, the majority of which (44%) with an emergency C-section, performed possibly due to lack of obstetric observation, while 12% of them without an actual medical reason, perhaps because of failure to cooperate and communicate with health professionals.

The results of our study show that the socio-demographic characteristics of expectant mothers, including nationality, immigration status and socio-economic status, significantly and independently determine the type of delivery.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 669
TITLE: MOLECULAR GENETIC ASPECT OF TANATOGENSESIS IN A PREMATURE NEWBORN WITH SEVERE RESPIRATORY DISTRESS SYNDROME
AUTHORS: M. Artsiusheuskaya1, A. Mikhalenka2, O. Malysheva2, G. Shishko1, A. Sukharava1, G. Kulakova3, N. Sitnik3, A. Kilchevsky2.
AFFILIATIONS: 1 Belarusian Medical Academy of Post-Graduate Education, Minsk, Belarus
2 Institute of Genetics and Cytology of NASB, Minsk, Belarus
3 Clinical Maternity Hospital of Minsk region, Minsk, Belarus

CONTENT:
The preterm birth rate was about 4% of infants born in Belarus in 2018 year.
The risk of death in the neonatal period in premature infants is 20 times higher than in full-term newborns. Therefore, reducing infant mortality is one of the most important tasks of neonatology.

Molecular genetic predictors determining the severity of the progression of the disease are currently under discussion.

The preterm male baby C. was born at 28–29 weeks gestation from the second pregnancy complicated by intrauterine growth restriction. The obstetric history showed that the first pregnancy ended with a fetus death at 20–21 weeks gestation. The baby C. was born by emergency caesarean section. His weight was 770 g (3rd to 10th centile), length - 34 cm (3rd to 10th centile), head circumference - 24 cm (3rd to 10th centile).

The infant suffered from severe respiratory distress syndrome at birth, which required intubation and surfactant administration. From the second day of life the respiratory failure and ventilator parameters increased, and the need for oxygen reached 100%.

Laboratory analysis revealed leucopenia and severe thrombocytopenia. On the third day of life hemorrhagic syndrome appeared in the form of gastric and repeated pulmonary hemorrhages. The newborn developed disseminated intravascular coagulation and resistant shock.

The infant received antibacterial, inotropic therapy, correction of thrombocytopenia.

The child’s condition progressively worsened and he died at the age of 5 days.

Analysis of the proband DNA was performed using the Illumina TruSight One sequencing panel on the MiSeq platform (Illumina, San Diego, CA). FASTQ files were received in the Basespace automated digital cloud of the sequencer manufacturing company. The alignment of the data on the reference genome and the identification of variants were performed using the Illumina DRAGEN platform (Dynamic Read Analysis for GENomics). VCF file was annotated by the wANNOVAR, Variant Studio and Variant Interpreter. Filtering of variants was executed according to the frequency of occurrence of an alternative variant (≤ 0.5%) in the 1000G, ExAc, gnomadGenome, gnomadExome databases; functional assessment of the exon variant, homo- or heterozygosity of the variant, and according to the prediction of the possible pathogenicity of the variant (SIFT, PolyPhen2, MutationTaster). Pathogenic and probably pathogenic variants found in investigated sample are presented in table № 1. Sequence analyses revealed the presence of a pathogenic variant in exon 9 of the C8B gene (c.1282C>T/p.Arg428*б NM_000066) responsible for complement component 8 deficiency, atypical immune response and very rare primary immunodeficiency. Also, a heterozygous variant in exon 5 of the LYST gene (c.T1334G/p.F445C, NM_000081), not described earlier, was detected in the infant. This missense-variant is “possibly pathogenic” according to pathogenicity prediction algorithms. Homozygous mutations in LYST are associated with some primary immunodeficiency diseases, thrombocytopenia and coagulation disorders. Two heterozygous probably pathogenic variants were found in the HYDIN gene (p.Arg2298Gly, p.Asn724Asp). Homozygous and compound heterozygous mutations in HYDIN are associated with respiratory insufficiency, chronic wet cough, chronic bronchitis, chronic rhinosinusitis, bronchiectasis. These two variants require confirmation of the compound heterozygosity.
The described variants require further study and confirmation of their pathogenicity. It is also required to carry out genetic testing and clinical examination of the parents of the proband for further prenatal diagnosis.

**IMAGE / TAB:**
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=cb6c3cb24bf3cddf0c2c4bf7296456Cd-MjAxOS0wNSM1Y2UyNyY2Y2I2YTFh

**IMAGE / TAB CAPTION:**

**COI:** None declared".
ID: 670
TITLE: SNAP-PE SCORE: ASSESSMENT OF MORBIDITY IN NICU.
AFFILIATIONS: NICU, Nikaia General Hospital “Agios Panteleimon”, Piraeus, Greece

CONTENT:
Although routinely available markers of risk such as birth weight, gestational age, and sex are considered to be good prognostic markers of neonatal outcome in Neonatal Intensive Care Units (NICU), there are additional factors that may affect the clinical course of these newborns. The SNAP-PE score, among others, seems a reliable marker of evaluating the overall morbidity and mortality in NICU, which has been used internationally in studies and researches over the past 25 years. We aimed to assess the contribution of the SNAPPE-II as predictor of morbidity and mortality in neonates of our unit.

230 hospitalized newborns in our NICU were studied over a year. On admission, the following data were recorded: gestational age, blood glucose levels, pH and body temperature. The SNAP-PE score defined through SFAR electronic system, was performed during the first 24 hours of admission. Morbidity (asphyxia/perinatal stress, Respiratory Distress Syndrome, Intraventricular Hemorrhage, septicemia, jaundice, bronchopulmonary dysplasia), duration and type of mechanical ventilation, day of full enteral feeding and length of hospital stay, were also recorded. Spearman’s rank correlation coefficient was used to determine the relation existing between SNAP-PE score and all the other recorded data.

Among neonates with increased morbidity, the SNAP-PE score was higher at a statistically significant level (p-value <0.05).

Our study showed that the SNAP-PE score is a very reliable marker of morbidity and mortality in NICU and helps the clinician in identifying very sick neonates and prioritizing treatment to these neonates. It could also be used as an additional communication code between different units (as long as its use is generalized) and as a guide to counseling parents about the severity of their newborn condition.

IMAGE / TAB:
IMAGE / TAB CAPTION:
COI: None declared
ID: 673
TITLE: Group B streptococcal sepsis: Experience of one tertiary neonatal unit. A 12-year review.
AUTHORS: Nicola McMullan 1; Cora Hiatt 1; Puneet Nath 1; Samita Majumdar 1
AFFILIATIONS: 1. University Hospital Coventry, United Kingdom

CONTENT:
Group B streptococcus (GBS) is one of the most common causes of neonatal sepsis, and can lead to significant morbidity and mortality. Despite a risk-based prevention strategy introduced in 2003, the incidence of neonatal GBS sepsis has increased in the United Kingdom. The aim of this retrospective review was to review the burden of GBS sepsis in a tertiary neonatal unit, University Hospital Coventry (UHCW).

A retrospective review of neonates admitted over a 12-year period between 2007-2019 with positive blood cultures for GBS was conducted. Eligible babies were identified from microbiology records, and further data obtained from clinical notes and Badgernet. No data for neonates with GBS sepsis outside the neonatal unit was considered. Early-onset sepsis was defined as sepsis occurring 7 days of life.

33 episodes of GBS sepsis were identified. The overall incidence on the neonatal unit was 0.482 per 1000 live births at UHCW. The incidence of GBS sepsis was 1.6 per 1000 neonatal admissions between 2014-2019. Early onset GBS sepsis accounted for 75.8% of cases (56% >37 weeks gestation; range 22+6-42). Common risk factors were maternal sepsis (50%), prematurity (44%) and prolonged rupture of membranes (28%). All symptomatic babies presented within 14 hours, with respiratory distress. Mean maximal CRP was 70. 12% had meningitis. 4% suffered significant morbidity. 8% died (confounded by extreme prematurity).
Late-onset GBS sepsis accounted for 24.2% of cases (gestations 28+2-33+2), presenting between day 10-69. Infants most commonly presented with respiratory distress (87.5%). Mean maximal CRP was 128. 12.5% had meningitis. No deaths or significant morbidity was reported in available data.

Over a 12-year period, 33 episodes of GBS sepsis were identified on our tertiary neonatal unit. This has a significant impact on babies, and their families, and highlights the ongoing burden despite the current risk-based guidance in the United Kingdom. Further discussion is needed on appropriate measures to prevent, and reduce the burden of this disease.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 681  
TITLE: The use of therapeutic hypothermia in neonatal supraventricular tachycardia  
AUTHORS: Dr Amelia Shaw 1  
AFFILIATIONS: Neonatal Unit, Leeds General Infirmary, Leeds Teaching Hospitals NHS Trust, Leeds, West Yorkshire, UK  

CONTENT:

Supraventricular tachycardia (SVT) is the commonest arrhythmia to present in neonates. The estimated incidence is between 1 in 250 to 1 in 1000. Predisposing factors include congenital heart disease and drug therapy. Although there are several anti-arrhythmic drugs indicated in treatment, SVT can be intractable. In this case specialist tertiary advice is indicated. We report two case studies of patients transferred to the tertiary neonatal unit for cardiology input. In both cases controlled hypothermia was utilised to reduce metabolic requirements and cardiovascular load. The process involved is discussed and learning points considered.

Case 1

A preterm infant was born in the tertiary, specialist centre after identification of fetal tachycardia in the third trimester. Mum had received antenatal treatment with flecanidn, digoxin and sotolol. The arrhythmia persisted and antenatal steroids were administered. There were also concerns regarding poor cardiac function on the most recent imaging, although no hydrops was evident. The infant was born via caesarean section at 34+0 with a birthweight of 2.54 kg. Although the patient was born in a good condition a tachycardia greater than 200 beats per minute was present. At 2 minutes of age an apnoeic episode occurred which responded to delivery of inflation breaths via facemask. The infant was admitted to the neonatal unit where SVT was confirmed. He proceeded to develop a marked respiratory acidosis and required intubation.

SVT was treated with increasing doses of adenosine (up to 500 micrograms/kg). An intravenous amiodarone infusion was also commenced. Transient termination of the arrhythmia was seen over the course of the first 48 hours. On day 3 of life the infant decompensated whilst in SVT, with profound hypotension and a pulseless electrical activity (PEA) arrest. A period of cardiopulmonary resuscitation was required, along with synchronised direct current (DC) shock. Over the next 12 hours the patient experienced further episodes of decompensation and required a further two DC shocks. A half loading dose of amiodarone was given, digoxin commenced and inotropes started. After liaison between the paediatric cardiology arrhythmia specialist, consultant paediatric cardiologist on call and neonatal consultant on call the decision was made to commence therapeutic cooling to a core temperature of 34 degrees. Temperature was monitored using a rectal thermometer and cooling facilitated by use of the Tecotherm Neo (thermo-regulation system). Following this stability in rhythm was maintained and the patient remained in sinus rhythm. Intravenous amiodarone was converted to oral equivalent dosing after feeds were established. No deterioration was seen during a period of rewarming. The patient was discharged at 38+4 gestation on a daily dose of 6mg/kg amiodarone and twice daily dose of 1.6micrograms/kg digoxin. Outpatient follow up was arranged with the neonatal and cardiology team.

Case 2

A 34+3 week gestation neonate was born in a level 2 unit following an emergency caesarean section for reduced fetal movements. No antenatal steroids were administered. There had been no antenatal concerns prior to this. It was the first pregnancy for parents with no significant medical history. There were no reports of drug or alcohol use.

The infant was born in a very poor condition with no heart rate. Resuscitation was commenced with response in the heart rate seen after delivery of effective inflation and ventilation breaths. The first gasp occurred at 3 minutes with spontaneous respiration not developing until 5 minutes. Apgar scores were 1 at 1 minute, 4 at 5 minutes and 6 at 10 minutes. Given the baby remained floppy and poorly responsive the decision was made to intubate. Upon admission to the neonatal unit it became apparent the baby was hypotensive and inotropes were commenced. There were thought to be initial difficulties with detecting the heart rate. It later transpired this was because a rapid tachycardia was present and subsequently the patient was diagnosed with SVT. At this point IV adenosine was administered and preparation made for transfer to the tertiary unit.
Following transfer, the patient remained in a poor condition. High ventilator requirements were necessary with use of four inotropes to maintain blood pressure. Despite this perfusion and cardiac output remained poor. SVT was treated with adenosine, amiodarone and digoxin. While awaiting amiodarone to reach a steady state PEA arrest occurred with periods of CPR required. After blood pressure stabilised the decision was made to actively cool the patient to 34 degrees with transient improvement seen. Further discussion was conducted with the family, including the option to perform extracorporeal membrane oxygenation (ECMO). The decision was made to concentrate on comfort care and the patient died shortly afterwards.

These cases describe the use of hypothermia in preterm infants with episodes of supraventricular tachycardia. They identify that hypothermia may be useful as an adjunctive treatment to drug therapy in intractable arrhythmia. The early identification of SVT is warranted to improve outcome and effectiveness of treatment. Further consideration of cooling is warranted and more evidence required.

IMAGE / TAB:

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COI: None declared
ID: 683  
TITLE: A MODEL FOR PATIENT SAFETY WORK  
AUTHORS: Agnes Linnér 1; Karl Hybinette 2; Lars Navér 3  
AFFILIATIONS: Neonatal Unit, Karolinska University Hospital, Stockholm, Sweden

CONTENT:
Neonatal care is developing quickly based not only on evidence from research but also on experience of caring for infants born at younger gestational ages. The environment in the neonatal intensive care unit is complex with new technology, shortage of staff and a culture where parents are involved in the care of their infant to an increasing extent. This poses a challenge to the staff who need to be resilient and to continuously adapt to new circumstances. Patient safety work at Karolinska University Hospital Neonatal Unit is a model for learning from mistakes and developing care.

Patient safety work is centered around an interdisciplinary group of nurses and doctors from each of the three Karolinska Units at Danderyd, Huddinge and Solna together with quality controllers and under the lead of the acting director and a patient safety coordinator. The patient safety coordinator is also a doctoral student in patient safety work at Karolinska Institutet, brings new knowledge to the group and gives lectures to other units within and outside our hospital. All staff report mistakes and deviations in an electronic system from which the group extracts red threads and major events. Event fatalities are classified depending on the risk per se and the consequence for the patient and major events are analyzed further and reported for external assessment.

Nursing staff report deviations of many kinds whereas the medical staff have not yet endorsed the practice to the same extent. A group of about five nurses and doctors are trained to do event analyses to identified structural challenges posing risks to our neonatal patients and parents and suggesting areas for improvement. The acting director finally decides on any changes to the practice and communicates with head of the hospital and the Health and Social Care Inspectorate for external assessments. Decisions are communicated to and discussed to parents, within the staff and lays ground for continued learning and improvement.

A blame free culture, a systems' perspective and a non-hierarchical patient safety system has laid a ground for patient safety work, quality improvement and parental involvement n our department.

IMAGE / TAB:

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COI: None
ID: 689

**TITLE:** A RETROSPECTIVE ANALYSIS OF THE FREQUENCY AND STRUCTURE OF CONGENITAL ANOMALIES OF DIGESTIVE TRACT

**AUTHORS:** (e.g. A.Sadykova 1; R..Boranbayeva 2; G.Berdiyarova 3; G.Chingayeva 4; V.Zhovnir 5)

**AFFILIATIONS:** (e.g.: 1 Department of neonatology and neonatal surgery, Scientific Center of Pediatrics and Pediatric Surgery, Almaty, Kazakhstan; 2 Director of Scientific Center of Pediatrics and Pediatric Surgery, Almaty, Kazakhstan; 3 Department of Neonatal Resuscitation, Scientific Center of Pediatrics and Pediatric Surgery, Almaty, Kazakhstan; 4 Chair of Children’s Nephrology, Asfendiyarov Kazakh National Medical University; 5 Director of Center for Pediatric Cardiology and Cardiac Surgery, Kiev, Ukraine)

**CONTENT:**

One of the main priorities of every country is to reduce the infant mortality rate. According to the EUROCAT data annually about 104,000 thousand (or 2.5%) newborns among 5.2 million of live births are born with various birth defects. Over the past 5 years (2012-2016) in Europe, the incidence of congenital malformations of the gastrointestinal tract was 20.03 cases per 10,000 births (EUROCAT Prevalence Data). In Kazakhstan (2017) despite of notable progress in medicine, in structure of infant mortality, mortality from birth defects takes second place (20.8%). That is why, the problem of congenital anomalies in newborns has not only medical, but social and national meaning.

This was a retrospective analysis involving 45 newborns with an established diagnosis of congenital malformations of gastrointestinal tract from 2017–2018, in Scientific Center of Pediatrics and Pediatric Surgery, Kazakhstan.

In study period (2017–2018) we identified 93 newborns with various kinds of congenital anomalies. In Scientific Center of Pediatrics and Pediatric Surgery the total frequency of birth defects remained at the same level: in 2017 was 52.6% (49 cases); in 2018, 47.3% (44 cases). Among them, the incidence rate of congenital disorders of digestive tract established in 48.3% (45 children). In structure of gastrointestinal malformations in an equal percentage of cases there were malformations of the small intestine (atresia) — 26.6% (12) and the defects of anorectal area — 24.4% (11). In 17.7% (8) of cases we diagnosed esophageal malformations represented as by esophageal atresia with tracheoesophageal fistula. Also we estimated: Ledd’s syndrome-8.8%, Hirschsprung’s disease-6.6%, annular pancreas-4.4%, intrauterine intestinal inversion-4.4%, colon atresia-2.2% and Vacter syndrome-2.2%.

To conclude, taking the international experience as an example (EUROCAT) in Republic of Kazakhstan creating a unified system for detecting, registering and monitoring the level of congenital anomalies is still a great topic, because solvation of this problem can significantly reduce the perinatal morbidity and mortality of children.

**IMAGE / TAB:**
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=61e0a640af88d3c644a163b0ddcd56-MjAxOS0wNSM1Y2UyNjY2Y2MwMDE3

**IMAGE / TAB CAPTION:**
"COI: "None declared"
ID: 690
TITLE: MOTHER'S EXPERIENCE OF THE BUCCAL ADMINISTRATION OF COLOSTRUM IN PRETERM INFANT – CASE REPORT
AUTHORS: Renata Vettorazzi 1; Helena Rakita 2; Vislava Globevnik Velikonja 3
AFFILIATIONS: 1 University of Ljubljana, Faculty of Health Sciences, Ljubljana Slovenia; 2-3 University Medical Center Ljubljana, Department for Obstetrics and Gynecology, Ljubljana, Slovenia.

CONTENT:
Breast milk is the best choice of nutrition for preterm infants. The colostrum has an important biological, protective role for preterm infants in the first, critical days of their lives. Buccal colonization with colostrum is recommended for the early colonization of preterm infants in intensive care units. The buccal application of the colostrum is performed directly on the inside of the oral mucosa. The purpose of this case report is to present the experience of the mother of a preterm infant with buccal application of the colostrum as a part of pilot study before starting this procedure in NICU.

The buccal application of the colostrum was made 3 hours after delivery to girl born in 26 GW, weight 965 grams in NICU in University medical center Ljubljana, Slovenia. We used a qualitative research approach. We conducted an interview with mother using a semi-structured questionnaire. The study was improved by Slovenia National medical ethics committee.

By the analysis of the interview, we found mother's good knowledge of the importance of breast milk and breastfeeding for her preterm infant. Positive opinion on the buccal colonization with colostrum, surprise over the procedure, which was an invaluable experience for her.

The mothers of preterm infants need pre-delivery instructions on the possibility of colostrum removal after delivery, and the buccal application of the colostrum. The buccal application gives them the impression, that they have done something good for their baby and motivate them to continue with milk expression.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 692

TITLE: HEALTH LOCUS OF CONTROL AND QUALITY OF LIFE OF PREGNANT WOMEN

AUTHORS: Luka Bočkor 1; Eva Andela Delale 1; Tonko Carić 1; Natalija Novokmet 1; Nives Fuchs 1; Deni Karelović 2; Stipan Janković 3; Sanja Musić Milanović 4; Noel Cameron 5; Saša Missoni1,6

AFFILIATIONS: 1 Institute for Anthropological Research, Zagreb, Croatia; 2 Department of Obstetrics and Gynecology, University Hospital Center Split, Split, Croatia; 3 Department for Radiologic Technology, University Department for Health Care Studies, University of Split, Split, Croatia; 4 Croatian Institute of Public Health Zagreb, Croatia; 5 Loughborough University, School of Sport, Exercise and Health Sciences, Loughborough, UK; 6 Faculty of medicine, J. J. Strossmayer University, Osijek, Croatia

CONTENT:
The experience of pregnancy challenges a belief in control over one's health; internal beliefs, the extent to which one's health is influenced by oneself, chance or fate and other people’s influence (powerful others). Belief that their health is related to their own behavior could increase their Quality of Life (QoL). This study gives insights from the Croatian Islands’ Birth Cohort Study (CRIBS) conducted on Adriatic island populations of Hvar and Brač and neighboring mainland area of the Split-Dalmatian County. The aims of the study were to investigate determinants of the QoL of pregnant women with focus on health locus of control as potential predictor of QoL domains.

The sample consisted of 286 healthy pregnant women, age 18 or older, 18 to 28 weeks of gestation, enrolled into study from February 2016 to June 2018. Comprehensive study of maternal health assessed WHOQoL-brief (Physical QoL, Psychological QoL, Social relationships and Environmental health domain), Adult Hope Scale, Multidimensional Health Locus of Control scales (MHLC), Edinburgh Postnatal Depression Scale, the perceived stress appraisals and demographic questionnaire. Enrolment into the study and all scheduled visits were carried out at doctor’s office where the pregnancy was routinely monitored and in the maternity unit in the University Hospital Center Split, Croatia. Inclusion criteria were 18 weeks or more of single pregnancy, not assisted with reproductive technology.

Woman had significantly higher internal then external locus of control (p=.000) and then chance (p=.000). They believed that they are in control of their health, also that powerful other people (medical doctors) were responsible for their health in a more significant way then that their health is in control of chance or luck (p=.000). MHLC scale scores explained significant amount of the total variance on QoL in all four domains (3.5% to 4.7%). Together with other predictors, greatest variance was explained in Psychological health domain (42%) and the smallest in Physical health (25%). Differences in MHLC between women living at island and neighboring mainland were also found. Health outcomes left to chance lower Environmental health QoL (health accessibility and quality, opportunities for acquiring new information, etc.), especially in less connected areas as islands.

With greater perception of all QoL domains but Physical, women believed more that powerful others are in control of their health outcomes, which could indicate that reliance on doctors and medical staff has an extraordinary importance in their lives. Understanding how health beliefs of women influence their QoL could have beneficial effects in establishing the best possible care standards and outcomes for women and newborns.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 697
TITLE: Reducing Term Neonate Admissions to the Intensive and High Dependency Care Neonatal Unit
AUTHORS: Ben Richardson 1, Nikita Lal 2, Cath Harrison 3
AFFILIATIONS: Department of Neonatal Medicine
Leeds Teaching Hospitals Trust
Leeds, UK.

CONTENT:
NHS England launched an initiative to change practice through keeping mothers and babies together and reduce term admissions to the neonatal unit (1, 2). This avoids the effects of infant and maternal separation and reduces costs in admissions. The four main areas focused on were respiratory conditions, jaundice, hypoglycemia and asphyxia. Across our Tertiary Obstetrics and Neonatal Centre* there are approximately 10,500 births per year. Of these 1500 are admitted to the Neonatal unit for which approximately one third are Term. After adjusting for cardiac and surgical admissions, the remaining majority fall into the above four areas.

Hypothermia was previously identified as a preventable contributor to hypoglycemia and from each case being subject to a root cause analysis, our admission rates have reduced in this area. Ongoing weekly multidisciplinary team meetings between Obstetrics, Neonatology, Transitional Care and Risk Management review all term admissions. Data now shows respiratory distress accounts for a significant amount of potentially avoidable admissions.
A guideline and poster have been developed aiding the approach to the assessment of babies immediately after birth focusing on their respiratory status.
Weekly MDT meetings continue to review all avoidable admissions and to categorize each admission into the ATAIN (1) categories described above.

Between 35 and 40 term admissions are identified using our data systems each month and each case has a “deep dive” into each section of care- antenatal, delivery, resuscitation and postnatal care to look at avoidable factors.
Results show that 61% of term admission are due to respiratory distress, 18% for hypoglycemia and only 3% for hypothermia. Ongoing surveillance with implementation of the flowchart continues.

Infants with respiratory distress can create significant anxiety for parents, midwives and junior doctors. Through creation of a reference standard of clinical care and management unnecessary admissions should be avoided.
ID: 704

TITLE: EX UTERO INTRAPARTUM TREATMENT (EXIT): A CASE SERIES HIGHLIGHTING THE URGENT NEED FOR CO-LOCATION OF MATERNITY AND PAEDIATRIC TERTIARY SERVICES IN IRELAND

AUTHORS: Niamh Ó Catháin 1, Erica Crothers 1, Breda Hayes 2, Anna Curley 3, Jan Miletin 4, Aisling Snow 5, David Mannion 6, Rania Mehanna 7, John Russell 7, Pamela MJ O’Connor 1,4.

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5. Department of Paediatric Radiology, CHI Crumlin, Dublin 12, Ireland.
6. Department of Anaesthetics, CHI Crumlin, Dublin 12, Ireland.
7. Department of Paediatric Otolaryngology, CHI Crumlin, Dublin 12, Ireland.

CONTENT:
Ex Utero Intrapartum Treatment (EXIT) is a rare form of neonatal resuscitation and has dramatically improved the survival of neonates with antenatally diagnosed airway obstruction1,2. EXIT requires multidisciplinary input from fetal medicine, radiology, anaesthetics, neonatology, paediatric otolaryngology and operating theatre staff, and is ideally carried out in a specialised delivery unit within a paediatric hospital3. Due to the absence of co-location of these services in the Republic of Ireland, a dedicated team was established in 2017 to facilitate EXIT in Irish tertiary level maternity hospitals. This report describes three cases of infants requiring EXIT in Ireland, from 2018 to 2019.

Case 1:
The first case is of a 34 year old Irish woman, with negative serology, and hypothyroidism with positive anti-TPO antibodies. She was booked in Hospital A, a tertiary level maternity hospital in Dublin. Antenatal ultrasound (US) at 18 weeks gestation showed severe polyhydramnios and a well-defined, homogenous solid anterior foetal neck mass. The patient had serial antenatal US and multidisciplinary specialist review with Foetal Medicine, Radiology, Neonatology, Anaesthetics and Paediatric Otolaryngology.
Foetal MRI at 27 weeks gestation showed that the mass was in keeping with a teratoma. The larynx was deviated to left. Following multidisciplinary team discussion, delivery via Caesarean section under general anaesthetic, and EXIT procedure was planned for 34 weeks gestation.

Delivery was expedited to 32 weeks gestation in view of interval development of worsening polyhydramnios and foetal right-sided pleural effusion. Prior to delivery, reduction amniocentesis of 1L was carried out, and subsequent to this US-guided drainage of 40ml fluid from largest cystic region of the foetal neck mass, was performed by an Interventional Radiologist.

At delivery a large cervicopharyngeal mass extending into mediastinum was visible. Trial of intubation was unsuccessful. A temporary Cook ventilating catheter was inserted by the paediatric otolaryngologist. Tracheostomy was performed with the temporary Cook ventilating catheter in situ during the procedure. The baby's body was then delivered and the umbilical cord was cut.

Apgars were 3 at 1 minute, and 4 at 5 minutes of life. The infant's heart rate was greater than 100 beats per minute (bpm) throughout the delivery and EXIT procedure. Right-sided pleural effusion was confirmed on US and 40ml drained via trochar. An umbilical venous catheter was inserted by the neonatologist. The baby was transferred ventilated via tracheostomy (Image 1), by the national Neonatal Transport Team (NNT) supported by the EXIT anaesthetist and paediatric otolaryngologist, to the Paediatric Intensive Care Unit (PICU) in the tertiary-level paediatric hospital. Postnatal karyotype and microarray were normal, and the teratoma was subsequently found to have derived from the thyroid gland.

Case 2:
The second case is of a 30 year old Irish woman, with negative serology, who had her maternal care transferred from her local secondary level maternity hospital, following an antenatal US that revealed a suspected neck mass. She was referred for Foetal Medicine assessment in Hospital B, a tertiary level maternity hospital in Dublin. US at 22 weeks gestation showed
a large neck mass consistent with Cystic Hygroma. Amniocentesis showed a normal female karyotype. Foetal echocardiogram was normal. The patient had serial antenatal US throughout pregnancy and she had multidisciplinary team review with Foetal Medicine, Radiology, Neonatology, Anaesthesics and Paediatric Otologyngology. Foetal MRI at 33 weeks gestation showed a large, multiloculated, left-sided neck and face mass, and the airway appeared patent. Following multidisciplinary team discussion, the baby was delivered by Caesarean section under general anaesthesia at 36 weeks gestation. The baby’s head was delivered and she was intubated by the paediatric otolaryngologist, while on placental circulation. Her shoulders and arms were delivered and a peripheral IV cannula was inserted. Tracheostomy was performed by the paediatric otolaryngologist. Apgars were 4 at 1 minute, and 4 at 5 minutes of life. The baby’s body was then delivered and the umbilical cord was cut. The baby’s heart rate was greater than 100bpm throughout the delivery and EXIT procedure. An umbilical venous catheter was inserted by the neonatologist. The baby was transferred ventilated via tracheostomy, by the NNT, supported by the EXIT anaesthetist and paediatric otolaryngologist, to the PICU in the tertiary-level paediatric hospital. Postnatal karyotype and microarray were normal and the baby was commenced on a treatment course of targeted sclerotherapy of the cystic hygroma.

Case 3:
The third case is of a 32 year old Irish woman, with Hepatitis C positive serology and a history of substance misuse during pregnancy. Her care was transferred from her local secondary level maternity hospital to Hospital C, a tertiary level maternity hospital in Dublin, when routine antenatal US scanning at 22 weeks gestation, showed polyhydramnios, and suspected micrognathia. Follow-up US at 23 weeks gestation showed severe micrognathia and polyhydraminos. The differential diagnosis included Pierre Robin Sequence. Amniocentesis was not carried out in view of positive maternal serology, and non-invasive prenatal testing showed a female karyotype with low probability of trisomy 13, 18, 21. The patient had serial antenatal US throughout pregnancy and she had multidisciplinary team review, with Foetal Medicine, Radiology, Neonatology, Anaesthetics and Paediatric Otologyngology. Foetal MRI at 35 weeks gestation showed severe micrognathia, a patent trachea and a suspected secondary palate defect. Following multidisciplinary team discussion, the baby was delivered by Caesarean section under general anaesthetic at 36+1 weeks gestation. Estimated birth weight was 3kg. The baby’s head was delivered and she was intubated, while on placental circulation, with size 3 endotracheal tube by the paediatric otolaryngologist. The baby’s body was delivered and the umbilical cord was cut. Apgars were 4 at 1 minute and 4 at 5 minutes of life. The baby’s heart rate was greater than 100bpm throughout the delivery and resuscitation. An umbilical venous catheter was inserted by the neonatologist. Ketamine, fentanyl and pancuronium were administered to the baby by the EXIT team anaesthetist, in preparation for tracheostomy, and tracheostomy was performed on the resuscitator. The baby was transferred ventilated via tracheostomy, by the NNT, supported by the EXIT anaesthetist and paediatric otolaryngologist, to the PICU in the tertiary-level paediatric hospital. Postnatal karyotype and microarray were normal.

References:

These cases demonstrate the complexity of EXIT team mobilisation, and multi-specialist collaboration across separate maternity and paediatric services, causing rescheduling of operative lists in all centres, and requiring postnatal interhospital transfer of the neonates. This report highlights the urgent need for co-location of maternity and paediatric services in the Republic of Ireland, to ensure optimal standards of care for critical neonates.
IMAGE / TAB: https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=34a62fb6c8aeae731c6e6df552774f16-MjAxOS0wNSM1Y2UyNjY2Y2M0NzdI

IMAGE / TAB CAPTION: Case 1

COI: None declared
ID: 711

TITLE: MEGALENCEPHALY CAPILLARY MALFORMATION SYNDROME - A ONE IN A MILLION DIAGNOSIS!

AUTHORS: Dr Emma Bailey 1,
Dr Syed Ather Ahmed 2.

AFFILIATIONS: Neonatal Unit. Lister Hospital, Stevenage, Hertfordshire, UK

CONTENT:

Megalencephaly Capillary Malformation Syndrome (MCMS) is extremely rare, with only around 150 cases noted in literature reviews. It most commonly presents with features of macrocephaly and capillary haemangioma, and diagnosis stems from mutations in the PIK3CA gene.

Clinical diagnosis is made using Major and Minor criteria. Major criteria include; macrocephaly and capillary haemangioma. Minor criteria include; asymmetry or over growth, developmental delay, hypotonia, syndactyly or polydactyly, frontal bossing and hydrocephalus.

Baby F was born at 38+3 by emergency c-section. At delivery he was pale and floppy and made no respiratory effort. He required inflation and ventilation breaths until 4 minutes of life. He was then transferred to the Neonatal Intensive Care Unit (NICU) in view of respiratory distress. CPAP (continuous positive airway pressure) was started, a partial septic screen performed and antibiotics given.

In addition to his respiratory distress, the child was also noted to have a large vascular ‘birth mark’ extending from his lower left chest to his pubic symphysis, across the abdomen and back, then further down his left anterior thigh. This mark was light brown in colour, reticulate and diffuse. His head circumference was also noted to be at 91st centile whilst weight was on the 50th centile.

During his stay in NICU he recovered well, he was self-ventilating in air by 12hours of age and after 48 hours of antibiotics was discharged.

However his ‘birth mark’ was of greater interest. This was photographed and discussed with the Dermatology Team at Great Ormond Street Hospital in London, who accepted a referral for follow up after discharge.

At Great Ormond Street Hospital he had skin biopsies taken due to clinical suspicion of Megaloencephaly Capillary Malformation Syndrome (MCMS), looking for PIK3CA mutations.

A PIK3CA c1252G>A, p.(Glu418Lys) was detected in the skin biopsy and so confirmed the initial clinical diagnosis. PIK3CA mutations most commonly lead to a gain in function and result in activation of the PIK3-AKT pathway, resulting in increased cell growth, proliferation, survival as well as apoptosis. Mutations are most often post-zygotic.

NEURODEVELOPMENT

Baby F has since had an MRI which shows ‘macrocephaly, with extensive abnormal cortical formation in both cerebral hemispheres’.

The MRI brain in this case is typical of others reported in similar cases. Macrocephaly is most commonly derived from the megalencephaly but can also progress to hydrocephaly. However multiple variations are seen.

Others commonly documented are polymicrogyria (‘abnormally numerous and small folds of the cortical surface’), focal cortical dysplasia, cerebellar and cortical hemisphere size mis-match, along with thickening of the corpus callosum.

As mentioned, ventriculomegaly and hydrocephalus can also occur, which if they progress unnoticed can lead to tonsillar herniation. For this reason, regular monitoring of head circumference as well as red flagging patients to concerning signs is important.

Monitoring of developmental milestones is also important in these children, to assess extent of neural involvement as well as pick up any anomalies, for which early diagnosis could prevent long term damage. In fact regular MRI every 6months until age of 8 is recommended currently.

Baby F has so far had largely normal development assessments. His Bayley’s Scale of Infant Toddler Development showed only mild weakness in his fine motor skills but his gross motor skills were within normal limits.

CAPILLARY MALFORMATIONS
Capillary malformations are the most common type of skin lesion seen in MCMS. Though not diagnostic, as many healthy children can have similar skin lesions, they can help to quickly alert practitioners to other anomalies. Most commonly these dilated capillary lesions are found over the torso and limbs, or on the midline of the face. Similar to Baby F, they are often extensive and so help to ensure they are noted early. It is important to note that as with lesions seen in other vascular malformation syndromes, they can often fade with age. Other skin lesions seen in MCMS include cutis marmorata and port wine stains.

**GROWTH DISORDERS**

Most commonly children with MCMS present with enlarged head circumference. However degree of growth incongruence is variable, and can extend to; generalised hypertrophy, hemi-hypertrophy, and more subtle overgrowth of various body parts or result in generalised growth restriction. The latter is also likely affected by the extent of the neurological, and other, manifestations. The child in this case was noted to have a large head, which helped lead to the diagnosis, but no other changes were seen. Further monitoring of growth will show if any other abnormalities occur.

MCMS is a rare and complex disorder which can affect both the physical appearance and gross development of a child. Whilst capillary haemangiomas are common in healthy children considering differentials such as MCMS can ensure investigations such as MRIs, Genetic testing, monitoring of development and family support are put in place in a timely manner.

**IMAGE / TAB:**
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**IMAGE / TAB CAPTION:** Capillary haemangioma: Diffuse, reticulate vascular mark spread over Baby F's abdomen

**COI:** Nil
ID: 729  
TITLE: A FOUR-VESEL UMBILICAL CORD: PERSISTENT RIGHT UMBILICAL UMBILICAL VEIN  
AUTHORS: Rosa Lapolla 1, Luciana Romaniello 1, Simona Pesce 1, Michele Grisolia 1, Camilla Gizzi 1  
AFFILIATIONS: 1 NICU- AOR “San Carlo” Potenza, Italy  

CONTENT:  
During the early embryogenesis, the umbilical cord exists of 4 blood vessels(2 veins,2 arteries). By the 8 GA, the right umbilical vein become obliterated. It is extremely rare that it persist. Persistence of the right umbilical vein(PRUV)may be an isolated anomaly or may be part of more complex anomalies. In literature, PRUV has classically been describe as associated with other congenital abnormalities such as genitourinary malformations, vascular abnormalities, followed by skeletal system and congenital heart defects, malformation of the central nervous and labiopalatoschisis, IUGR, diaphragmatic hernia, asplenia, VACTERL and genetic syndromes. The malformation rate presented by PRUV cases was 19%.  

Physical examination of a healthy male, SGA, newborn revealed a four vessel umbilical cord. The routine prenatal ultrasonography did not show any abnormalities. He was born by Cesarean-section after an uneventful pregnancy. During the hospitalization, was performed: ultrasound imaging of the abdomen, cerebral, thorax and abdomen x-ray (normal); echocardiogram (atrial septal defect max 2.8 mm- and patent foramen ovale max1.5 mm-); genetic consultation that confirmed no dysmorphic features and suggested follow-up. So, the infant has been regularly followed up until the age of 6 months (normal follow up with closure of septal defects or of a patent foramen ovale). Recent study (Kumar 2016), based on a south Indian antenatal cohort, identified 23 cases of PRUV amongst 20452 pregnancies, yielding an incidence of 0.11%. A positive association between the presence of PRUV and the presence of heart congenital malformations (39 %) and single umbilical artery (13%) were found.  

Consistent with previous reports, in our case PRUV is an isolated finding. The presence of a fourth umbilical structure might often be unnoticed. However, this finding can be related to serious congenital anomalies including renal and cardiac malformations and therefore requires additional imaging. In our patient, ultrasound examination of the development and position of the heart and intra-abdominal organs did not reveal any abnormalities.  

IMAGE / TAB:  

IMAGE / TAB CAPTION:  

COI: None declared.
ID: 737
TITLE: ASSOCIATION OF PERINATAL FACTORS WITH SEVERE WHITE MATTER DAMAGE IN PRETERM NEONATES
AUTHORS: Aikaterini Drougia1, Dimitrios Rallis1, Vasileios Xydis2, Anastasia Giantsouli2, Meropi Tzoufi3, Maria Argyropoulou2, Vasileios Giapros1
AFFILIATIONS: 1. Neonatal Intensive Care Unit, Medical School, University Hospital of Ioannina, Ioannina, Greece
2. Department of Radiology, Medical School, University Hospital of Ioannina, Ioannina, Greece
3. Pediatric Neurology, Department Pediatrics, Medical School, University Hospital of Ioannina, Ioannina, Greece

CONTENT:
In preterm neonates, severe intraventricular haemorrhage (IVH-IV) and cystic periventricular leucomalacia (cPVL) are the most devastating components of white matter damage (WMD). Although they originate by different aetiologies, both entities represent the final outcome of severe insults and predispose to significant risk for adverse outcome.

Our aim was to evaluate any association of the perinatal risk factors for this specific WMD in a cohort of preterm neonates and to evaluate their neurodevelopmental outcome at two years of age.

All neonates ≤30 weeks’ gestation, admitted to the Neonatal Unit of University Hospital of Ioannina during 2006-2017 were enrolled. The WMD was defined by IVH-IV or cPVL, detected either on cranial ultrasound or brain MRI. Neonates without ultrasound within the first month or MRI at term equivalent age were excluded.

Nominal variables were compared with x² test of independence (or Fischer’s exact test whenever needed), while continuous variables with student’s t-test or non parametrical Mann Whitney U test. Logistic regression analysis was performed for the detection of significant perinatal risk factors for WMD.

Of 288 neonates, 50 (17%) neonates of 26.9±1.9 weeks’ gestation had evidence of WMD; 22 had cPVL, 24 IVH-IV and 4 had both IVH-IV and cPVL. On the contrary, 238 neonates of 28.2±1.7 weeks’ gestation had no evidence of severe IVH-IV or cPVL.

Lower gestational age (p <0.001), male gender (p=0.030), lack of antenatal steroids (p=0.003), resuscitation at birth (p=0.019), hypothermia on admission (p=0.012), early hypotension (p=0.017), blood transfusion (p<0.001), and prolonged mechanical ventilation (p=0.001) were related to the development of WMD.

In multivariate analysis, hypothermia (2.253, p=0.043, 95%CI 1.026-4.950) and blood transfusion (0.763, p=0.017, 95%CI 0.612-0.952) were significant risk factors for WMD.

Among neonates with WMD, 35 (70%) survived, and 12 (41%) had cerebral palsy, compared to 205 (87%) (p=0.010), and 3 (2%) (p<0.001) of the neonates without WMD, respectively.

In preterm neonates ≤30 weeks’ gestation, among other perinatal factors, hypothermia and blood transfusion are the most significant risk factors for WMD. Furthermore, the development of WMD is a strong predictor for cerebral palsy at two years of age.

IMAGE / TAB:
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IMAGE / TAB CAPTION:

COI: None declared
ID: 752

TITLE: PDGF/VEGF SIGNALLING IS INVOLVED IN HUMAN FETAL PROGENITOR CELL DIFFERENTIATION FOLLOWING SEVERE IVH

AUTHORS: Andriana Gialeli; Robert Spaull; Aranza Lopez; Óscar Cordero-Llana; Axel Heep; James Uney

AFFILIATIONS: a) Regenerative Medicine Laboratory, Bristol Medical School, University of Bristol, UK
b) Neonatal Neurology Group, Bristol Medical School, University of Bristol, UK

CONTENT:
One in five infants born under 32 weeks of gestation is affected by intraventricular haemorrhage (IVH) and is major cause of developmental disruption. IVH occurs at the subventricular zone (SVZ), due to the vulnerability of the vasculature in this area. If the SVZ disrupts, blood fills the ventricles and pro-inflammatory cytokines are released into the cerebrospinal fluid (CSF). The SVZ is rich in neural progenitor cells (NPCs). Studies suggest that NPCs appear in the CSF after IVH and CSF-NPCs interactions have been shown to influence NPC fate. Our aims are to confirm the presence of NPCs within the IVH-CSF and to study the effect of pro-inflammatory CSF on human fetal NPCs.

Cells were isolated from IVH-CSF and cultured in NPC proliferation medium (DMEM:F12, Pen/Strep, Glutamax, heparin, FGF, EGF). hNPCs were challenged with IVH-CSF (from 4 different patients and 3 different samples over the treatment progress) and the cytokine inhibitor (SU5614) to study their differentiation profile by immunocytochemistry (Tuj1, GFAP). CSF cytokine expression was determined by multiplex ELISA.

1) We were able to expand NPCs from one early sample from 6 IVH-patients. These NPCs were able to proliferate, give rise to secondary neurospheres and differentiate into neurons (Tuj1+ cells) and astrocytes (GFAP+ cells). 2) Our results show that IVH-CSF influences NPC fate causing an increase in astrocyte differentiation that can be rescued by the PDGFR/VEGFR inhibitor, SU5614. 3) We observed a decline in IL-1β and IL-6 CSF-expression and constitutively high CSF-levels of MCP-1

Our results support the presence of NPCs in the CSF at least in a subset of preterm babies with IVH. Furthermore, IVH-CSF may redirect NPC differentiation toward astrocytes and this may be mediated through PDGF/VEGF signaling. Our findings may reflect neuropathological responses in the development or resolution of IVH being accountable for compromised neuronal development observed in these patients.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: The authors declare no conflict of interest.
ID: 754

TITLE: NEONATAL ONSET SEIZURES IN SIBLINGS - CASE REPORT

AUTHORS: Dr Farah Abu Dhais 1,2,
Dr Sean Mathieson 1,2,
Dr Niamh McSweeney 3,
Dr Brendan Murphy 1,4,
Prof Geraldine B Boylan 1,2

AFFILIATIONS: 1 The Irish Centre for Fetal and Neonatal Translational Research (INFANT), Cork, Ireland.
2 Department of Paediatrics and Child Health, University College Cork, Cork, Ireland.
3 Department of Paediatrics, Cork University Hospital. Cork, Ireland.
4 Department of Neonatology, Cork University Maternity Hospital, Cork, Ireland.

CONTENT:

Benign Familial Neonatal Seizures (BFNS) is a dominantly inherited disorder caused by mutations in KCNQ2/KCNQ3 genes. Other gene variations are implicated in familial epilepsies, and advanced genetic testing suggests additional mutations may predispose to early-onset epilepsy. Mutations in Ryanodine Receptor 3 (Ryr3) gene have been reported in two cases of epileptic encephalopathy but no causative link is firmly established. We describe two siblings who presented with early-onset neonatal seizures which had similar clinical and electrographic manifestations, and resembled the course seen in BFNS individuals. Two Ryr3 heterozygous mutations were found on genetic testing of the second sibling.

Sibling 1 was born at term by vaginal delivery with normal APGARS. He presented with jerky movements on day five of life and was admitted to the neonatal unit at Cork University maternity hospital. During admission, he developed multiple electro-clinical seizures which manifested as tonic extension of the arms and clonic movements of the legs, accompanied by very high amplitude (up to 1mV) sharp waves at 1-1.5Hz over the fronto-central regions bilaterally, later followed by faster spike or polyspike and wave activity at ~3Hz. The seizures were terminated with a loading dose of phenobarbitone (20mg/kg) and he became seizure-free by day 7 of life. Results of basic metabolic testing and brain MRI were all within normal. He was discharged on day 12 with a working diagnosis of BFNS, and has been doing well since, except for an episode of febrile convulsion as an infant, and minor phonological issues for which he is attending speech therapy at the current age of 7 years.

Sibling 2 was also delivered vaginally with normal APGARS at term. She was admitted on day 3 of life to the neonatal unit with episodes of repetitive eye blinking followed by clonic upper limb movements lasting G and c.704C>T). She was discharged off medications on day 8 and has been seizure-free with normal development at the age of 1 year. Genetic testing was also sent for both parents and revealed a heterozygous mutation in each parent; c.4483A>G variant in the father and c.704C>T in the mother.

We present two siblings with neonatal onset seizures presenting similarly to BFNS, with genetics for one sibling showing no KCNQ2/3 mutations but two Ryr3 mutations of unknown significance. There is currently very limited evidence to support a role for this receptor in neonatal seizures, but the cases presented here may contribute to this evidence.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
**ID:** 772  
**TITLE:** Clinical, practical and ethical implications of introducing donor human milk (DHM) from Human Milk Banks (HMBs) into infant feeding regimes on neonatal units (NNUs)  
**AUTHORS:** Gillian Weaver  
**AFFILIATIONS:** Human Milk Foundation (including Hearts Milk Bank); Harpenden, Hertfordshire, UK

**CONTENT:**
Recent years have seen a marked growth in the number of HMBs and the use of DHM. Currently 600 HMBs exist in 60 countries. HMBs have also grown in size to provide more DHM to NNUs. The result is a widespread increase in the number of infants receiving DHM globally. It is also common for mothers of NNU infants to be recruited as milk donors.

Maternal milk is the preferred feeding choice. The introduction of DHM brings a need for suitable staff training to ensure its safe storage, handling and clinical use and ensure its availability doesn’t undermine breastfeeding as well as to provide an understanding of its ethical implications including consent, equity of access and recruitment of donors.

The Hearts Milk Bank was established in 2016 to bring assured and sustainable provision of DHM to hospital NNUs throughout the South East of England. It was the first new milk bank in the UK for over 10 years and the first without financial or other direct operational links to the National Health Service (NHS). The Hearts Milk Bank operates as a social enterprise (a non-profit organization). The co-founders are a specialist human milk banking expert (Gillian Weaver) and former paediatric surgeon and cancer researcher (Dr Natalie Shenker). The joint aim was to facilitate assured and equitable access to DHM to NNUs whilst promoting its use in support of optimal maternal lactation and breastfeeding. To this end, the availability of screened and heat treated DHM from fully screened donors has been accompanied by the provision of training opportunities for all neonatal staff. In addition, parental/carer literature that reflects the optimal use of DHM accompanies all milk supplied to NNUs. This includes information for mothers on how to optimise their lactation and so facilitate maximum use of their own milk.

The staff training includes practical issues surrounding the introduction and use of DHM on a NNU with topics such as the provision of safe and secure storage facilities, thawing and handling of DHM, how to ensure full tracking and traceability, transporting DHM, and delivery of the milk to the baby. The training is fully based on the recommendations included in the NICE Clinical Guideline Donor Milk Banks; service operation (https://www.nice.org.uk/guidance/cg93) and the British Dietetic Association (BDA) guideline ‘Guidelines for the Preparation and Handling of Expressed and Donor Breast Milk and Special Feeds for Infants and Children in Neonatal and Paediatric Health Care Settings’ available from https://www.bda.uk.com/. The aim is that all neonatal staff in contact with parents are able to confidently answer questions about DHM and the milk banking process.

Within the space of 2 years the Hearts Milk Bank has facilitated the introduction of DHM to 7 hospital NNUs whilst supplying increasing volumes of milk to an additional 20 NNUs. The increased NNU provision reflects the wider use of DHM to older preterm infants and to infants born at term.

Ethical considerations accompany the use of DHM. These include equity of access and ensuring fully informed parental consent is obtained for its use as well as those related to the recruitment of NNU mothers as breastmilk donors. The recruitment of bereaved mothers as donors raises additional ethical and practical questions and necessitates the availability within the neonatal unit and milk bank teams of staff with the skills to support mothers in these challenging and sad circumstances.

The introduction of DHM into hospital NNUs brings the need for robust and well designed training to ensure the milk is used optimally and staff are able to confidently answer parents’ questions. The practical and ethical implications of its use are best met with the provision of training for all relevant staff and this should not be neglected in the move to increase the availability and use of DHM. Human milk banks should undertake this training.
I declare that I work in the field of human milk banking as a consultant and am a former President and current board member of the European Milk Bank Association.
ID: 774

TITLE: GROWTH ON A LEVEL 2 UK NEONATAL UNIT

AUTHORS: Aoife Hurley 1

AFFILIATIONS: 1. Neonatal Unit, University Teaching Hospital, Lusaka, Zambia
2. Neonatal Unit, Leeds Teaching Hospitals Trust, Leeds, UK

CONTENT:

Mid Yorkshire Neonatal unit is a level 2 unit that admits infants above 800g, 27 week singletons or 28 week multiple births. Growth is reviewed weekly with weekly head circumferences and twice weekly weights. There is a Yorkshire and Humber Neonatal Feeding guideline for the preterm infant, stating preterm infants should be gaining 15-20g/kg/day. Growth was reviewed to see if achieving recommended growth.

Collected data on all infants inpatients more than 14 days from January 2018 to March 2018. Paper patient notes and electronic database Badger were used. Documented time to first feeds, to full feed, if received EBM. Birth and discharge weights and head circumferences were recorded, along with their centiles.

In total 39 infants with 4 term and 35 pre term. Average length of stay was 35 days. At discharge 37% of preterm infants had a weight gain of 15-20g/kg/day, 40% had a weight gain of 10-15g/kg/day, 17% had weight gain less than 10g/kg/day and 6% lost weight. For term infants 50% lost weight, 25% gained weight and 25% had static weight. 69% had maximum feed of 150mls/kg/day. Average time to first feeds was 1.8 days, and 6.5 days to full feeds. 44% discharged receiving EBM. 100% had birth weight recorded and 67% birth head circumferences. There were 100% of discharge weights and 77% of discharge head circumferences documented. 54% dropped more than 2 centiles in weight, and 9% dropped 2 head circumference centiles.

Despite the small sample size and missing data from notes and badger, it gives an indication of the growth on the unit. 87% gained weight by discharge, with 33% achieving recommended growth. A feeding pro forma sheet was created following clinical governance meeting. The unit is being re-audited after several months of using these sheets to see if there has been any change in in documentation, impact on growth and therefore length of admission.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
TITLE: OUTCOME OF EXTREMELY LOW BIRTH WEIGHT INFANTS AT THE UNIVERSITY CLINICS’ FOR GYNECOLOGY AND OBSTETRICS NEONATOLOGY DEPARTMENT, CLINICAL HOSPITAL SPLIT, CROATIA

AUTHORS: Anet Papazovska Cherepnalkovski, Marija Bucat, Ivanka Furlan, Vesna Pavlov, Luka Brajkovic

AFFILIATIONS: Department of neonatology, University Clinic for Gynecology and Obstetrics, University Clinical Center and School of Medicine Split, University of Split, Croatia

CONTENT:
Aim of the study was to show the outcome of infants of extremely low birth weight (ELBW), for a period of 2 years in Clinical Hospital Split and to compare the outcomes of these infants with the available literature data. Extremely low birth weight infants (ELBW) are defined by birth weight of less than 1000 g and gestational age of ≤ 27 weeks with particular focus in recent years on those born at the frontiers of survival. This group of infants relates to multiple specific problems that arise from extreme immaturity of organ systems.

Our study cohort consisted of 41 examinees with a birth weight of 500-999 g, of which 51.2% male, and 48.8% female. Analyzed parameters were: maternal data- parity, gravidity, antenatal steroids, syndrome of intra amniotic infection, pre/perinatal antibiotics, antenatal care, and mode of delivery as well as infant data- the major outcome (survival or death), gestational age, birth weight, head circumference, 1-minute Apgar scores, relevant clinical and laboratory findings and causes of death. All variables were compared between the two major outcome groups (survival or death).

The distribution of subjects by gender did not significantly differ between the outcome groups. The median gestational age of the surviving children was 4 weeks higher than in the expired children. The median birth weight of the surviving children was by 140 grams higher. Median Apgar score for survivors was by 2.5 higher compared to the other group. The share of emergency cesarean sections was 2.7 times higher in the surviving group. We did not find statistically significant correlations for the other examined maternal and fetal variables. We observed lesser than reported in the literature incidences of major ELBW morbidities such as bronchopulmonary dysplasia, retinopathy of prematurity, patency of ductus arterious, and central nervous system manifestations.

Survival of ELBW infants in our center was substantial. Strong predictors of outcome were birth weight and gestational age. Positive correlation was observed with cesarean section, better glycemic regulation and better hematological status. Effective steps are required for prevention of extreme prematurity, regular prenatal corticosteroid application, and long term follow up of the children for which appropriate data bases are essential.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
TITLE: VALPROATE IN PREGNANCY CAN CAUSE OF AICARDI-GOUTIERES SYNDROME TYPE 6

AUTHORS: Bernard Barzilay 1; Olga Rybalko 2; Olena Minich 3; Tetyana Yanina 4

AFFILIATIONS: 1 Head Neonatal Intensive Care Unit Shamir (Assaf Harofeh) Medical Center Zerifin, Israel
2 Medical Academy named after S.I. Georgievsky of Vernadsky CFU, Simferopol, Russia
3 Mayanei Hayeshua Medical Center, Tel Aviv, Israel
4 Medical Academy named after S.I. Georgievsky of Vernadsky CFU, Simferopol, Russia

CONTENT:
Aicardi-Goutieres syndrome-6 (AGS6) is caused by homozygous or compound heterozygous mutation in the ADAR gene on chromosome 1q21. This abstract describes three patients with AGS 6 from mothers who used high doses of valproate anticonvulsants over a long period of time. AGS is an early-onset progressive encephalopathy with basal ganglia calcification, leukodystrophy, lymphocytosis, elevated interferon-alfa levels in the cerebrospinal fluid, and no evidence of viral infection. Noninfectious leukoencephalopathy concurrent with multifocal epilepsy in early childhood suggest that the syndrome is an inherited disease.

These babies were born with respiratory distress, hyperkalaemia, hypoglycaemia, myotonia and microcephaly. These newborns were each the first children born of a non-consanguineous marriage. Their mothers had been taking VPA for epilepsy for the past 10, 12 and 15 years and were on a daily dose of 800, 1000, 1200 mg respectively throughout their pregnancies. They were compliant with folate at 800 mg daily. They had no history of taking other anticonvulsants like phenytoin or consuming alcohol. Polyhydramnios was detected at 31, 34 weeks of gestation. Each infant was born full term (38, 39 and 40 weeks) at a peripheral hospital via emergency Cesarean delivery for fetal distress. Their birth weights were 3200, 3800 and 4 kg with lengths of 50, 51 and 52 cm respectively. The newborns were admitted to the Neonatal Intensive Care Unit for respiratory distress and were discharged well. The possibility of teratogenic effects of VPA was considered and these children were diagnosed with valproate embryotothetopathy. Women did not take alcohol and drugs during their pregnancy, as a result, fetal alcohol spectrum disorders were excluded in these case series.

Phenotyping features of the first two girls were similar. They had stable microcephaly with a high and broad forehead; epicanthic folds; thin, arched, wide-spaced eyebrows; a small and upturned nose; a long and shallow philtrum; and a thick lower lip, low-set ears and small mouth. The boy had some differences in his appearance. There were nystagmus and progressive microcephaly, ear deformation, perauricular additions, rigidity, dystonia, bilateral striatal necrosis. Common features of these children are microencephaly, developmental delay, intracranial calcifications, leukodystrophy. The screening for TORCH, HIV, syphilis, hepatitis B and C infections was negative. Ultrasound of the abdomen showed no abnormality. EMG was normal. The karyotype for each child was normal. The work-up for inherited metabolic and mitochondrial diseases was negative. The spinal muscular atrophy gene testing was negative. After molecular karyotyping, compound heterozygous mutation was found in the ADAR gene on chromosome 1q21 and indicating Aicardi-Goutieres syndrome-6.

Overall, these findings suggest that mutation in the ADAR gene on chromosome 1q21 resulting in Aicardi-Goutieres syndrome-6 was caused by the teratogenic effects of VPA.

IMAGE / TAB:

IMAGE / TAB CAPTION:
COI: No conflict of interest statement
ID: 805  
**TITLE:** EXTUBATION FAILURE IN VERY LOW BIRTH WEIGHT INFANTS IN A TERTIARY NEONATAL INTENSIVE CARE UNIT  
**AUTHORS:** Dr. A Dr. A Jenkinson1, Dr. D Sweetman1 and Dr. LK McCarthy1,2  
**AFFILIATIONS:** 1Department of Neonatology, The National Maternity Hospital (NMH), Holles St, Dublin, Ireland.  
2 School of Medicine and Medical Science, University College Dublin, Ireland.  

**CONTENT:**  
Prolonged periods of mechanical ventilation in very low birthweight (VLBW) infants are associated with increased chronic lung disease (CLD). Therefore the earliest feasible withdrawal of mechanical ventilation is important in lowering respiratory morbidity.1 Predicting extubation success is difficult and rates of extubation failure in preterm infants are as high as 40-50%.2-4 No one clinical assessment tool predicts extubation success with accuracy and consistency. At our NICU the decision to extubate is made by the clinical team following regular bedside review. Our aim was to review the peri-extubation practices at our NICU; and to report the rate of extubation failure.  

The charts of all VLBW infants admitted to the NICU at NMH from January 1st to December 31st 2017 were reviewed. Infants were included if they had a birthweight < 1500g, were intubated and mechanically ventilated; and had a planned extubation attempt during their admission. Data relating to infant demographics, duration of intubation and ventilation, surfactant administration, post-natal corticosteroid use, ventilation parameters and oxygen concentration prior to extubation were collected. For the purposes of this study extubation failure was defined as a need for re-intubation within 72 hours of ETT removal. We only included data relating to the first extubation attempt for each individual infant.  

A total of 146 VLBW infants were admitted to our NICU in the study period. Of these, 56 (38%) were intubated and 48 (33%) had a planned extubation attempt. The mean (SD) gestational (GA) of the 52 included infants was 28(2) weeks, BW 1023(276)g. Extubation failure occurred in 8 (17%) of infants and was associated with a lower gestational age and birthweight, and longer duration of ventilation.  

See Table 1 – Results  

The rate of extubation failure at our NICU is lower than previously reported. Infants with lower gestational age, birth weight, higher supplemental O2 pre-extubation and a longer duration of intubation and ventilation were less likely to extubate successfully.  

We hypothesise that the lower rate of extubation failure may be attributable to less severe lung disease and a conservative approach in predicting extubation readiness.  

**IMAGE / TAB:**  
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**IMAGE / TAB CAPTION:** Table 1 Results  

**COI:** None declared
ID: 810

TITLE: CONTINUOUS INTRA-VENOUS (IV) VANCOMYCIN INFUSIONS: REDUCED RATE OF SUB-THERAPEUTIC BLOOD LEVELS ON CLINICAL AUDIT

AUTHORS: Rosalind Howe 1, Paul Cawley 1, Mark Dyke 1

AFFILIATIONS: 1. Neonatal Intensive Care Unit, Norfolk & Norwich University Hospital, UK

CONTENT:
Late onset sepsis & catheter related bloodstream infections remain a clinical challenge. Vancomycin's bactericidal efficacy is correlated with duration of exposure. Treatment may be ineffective if trough concentrations fall below the minimum inhibitory concentration. Our past clinical audit has identified failure to achieve vancomycin levels in target range using intermittent infusions (2010). Following new evidence, we have transitioned to a continuous infusion regimen.

Aim: To audit use of our new continuous vancomycin infusion guideline against pre-specified standards & determine if compliance with blood target levels has improved when compared with historical intermittent dosing data.

Prospective 7 month audit in 2017. All gestations
Continuous infusion regimen:
15 mg/kg loading dose (IV-1 hour) followed by continuous infusion. Starting rate as per serum creatinine & corrected gestational age (CGA):
Group 1: Creatinine < 40 μmol/L, CGA > = 40 weeks - Total Daily Dose: 50mg/kg/day
Group 2: Creatinine <40 μmol/L, CGA < 40 weeks - Total Daily Dose: 40mg/kg/day
Group 3: Creatinine 40 - 60 μmol/L, all CGAs - Total Daily Dose: 30mg/kg/day
Group 4: Creatinine > 60 μmol/L, all CGAs - Total Daily Dose: 20mg/kg/day

Vancomycin level at 12-24 hours. Target range 15-25mg/L; infusion rate adjusted if out of range.

Intermittent dosing regimen (2010):
15mg/kg every 24, 12 or 8 hours for infants <29, 29-35 or <35 weeks CGA respectively. Target trough range 10-15mg/L.

Analysis: 2 sided Chi-Square
Audit Standards:
Correct loading dose: 100%
First level taken at 12-24 hours: 75% (25% were >24 hours)
Infusion rate correctly increased if low level: 100%

First vancomycin levels (n=16):
Group 1: 1 below range, 0 in range, 2 above range.
Group 2: 0 below range, 5 in range, 2 above range.
Group 3: 0 below range, 3 in range, 1 above range.
Group 4: 0 below range, 2 in range, 0 above range.

All vancomycin levels (first & maintenance levels, n=61):
Low: 13% (Range 2.3-13.3 mg/L).
In range: 71% (Range 15-25 mg/L).
High: 16% (Range 25.1-33.2mg/L).

Comparison: Intermittent Dosing 2010 (n=43) vs Continuous Infusion 2017 (n=16):
The proportion of infants with first vancomycin levels in target was significantly higher in 2017 vs 2010 [63% vs 26%, p<0.01] and the proportion of infants with sub-therapeutic levels was significantly reduced [6% vs 56%, p<0.001]. See figure for levels by gestational age group.

Our new continuous IV infusion regimen has improved compliance with blood target levels and significantly reduced sub-therapeutic levels. Continued monitoring is indicated as a significant proportion of infants still have vancomycin levels out

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of range. Data relating to renal function or polypharmacy were not collected; these are important considerations when prescribing and administering vancomycin to individual infants.

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IMAGE / TAB CAPTION: Percentage of vancomycin levels in range, by gestational age group: 2010 vs 2017

COI: none declared
ID: 828  
TITLE: Congenital CMV infection and brain injury  
AUTHORS: Geethanath Ruppa Mohanram  
AFFILIATIONS: Sunderland Royal Hospital  
Kayll road  
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SR4 7TP  
United Kingdom  

CONTENT:  
Cytomegalovirus is the most prevalent virus causing neurological dysfunction in the developing brain. It is the most common infection known to be transmitted in utero. In the United Kingdom, CMV has been implicated in 12% of sensorineural hearing loss and 8% of cerebral palsy. Primary CMV infection in pregnancy has a 40% risk of congenital CMV infection. Intraventricular haemorrhage is the commonest cause for subependymal pseudocysts (SEPC). SEPC of nonhaemorrhagic origin should prompt to search for neurotropic congenital viral infections, particularly cytomegalovirus infections. A 4 week old baby who had bilateral SEPC on cranial ultrasound had congenital CMV infection.

A female baby was delivered by an emergency caesarean section for suboptimal CTG at 37 weeks gestation to a primigravida mother with an uneventful pregnancy. The birth weight was 2.15kg and head circumference was 31.0 cms both of which were below 0.4th centile. There were no dysmorphic features and the baby was otherwise clinically well with normal clinical examination. Baby was observed for 24 hours and sent home after establishing feeds. There were no concerns regarding blood sugar during the hospital stay. In view of growth retardation, no investigations were undertaken initially on the baby but placenta was sent for histopathological examination. The placenta showed evidenced of multifocal chronic villitis and cytomegalic inclusion bearing cells were noted which was confirmed by immunohistochemistry. This was suggestive of chronic CMV villitis. In view of this report, baby was reviewed at the age of 4 weeks. There were no petechiae but baby was still jaundiced at 4 weeks of age. There was evidence of hepatosplenomegaly on clinical examination. There was no evidence of any cataract and an ophthalmology examination revealed no active retinitis but there were 2 small retinal scars in right eye and one small retinal scar on the left eye. Baby was investigated with blood and urine tests for CMV infection which were positive. A cranial ultrasound examination showed bilateral subependymal pseudocysts with a typical honey comb pattern (Figure). An MRI brain scan showed delayed myelination but otherwise structurally normal. This baby had a normal hearing screening examination. The viral load for CMV was high and baby was confirmed to have congenital CMV infection as the blood test from the mother (stored blood which was taken at 9 weeks gestation) was positive for CMV IgM. This baby was commenced on Valganciclovir and follow up examination at 5 months of age showed normal neurodevelopment without any sequelae.

Cytomegalovirus infects all cell types but it shows a preferential tropism for neural stem/progenitor cells. The germinal matrix is the area in the developing brain which contains neural stem cell population and is situated adjacent to the lateral ventricles as a subependymal layer. SEPC of nonhaemorrhagic origin should prompt to search for neurotropic congenital viral infections, particularly congenital cytomegalovirus and rubella infections.

IMAGE / TAB:  
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IMAGE / TAB CAPTION: Subependymal pseudocysts  

COI: None declared
ID: 829

TITLE: REAL WORLD DATA – HIDDEN TREASURE FOR NEONATAL RESEARCH? EUROPEAN PARENTS’ OPINION SURVEY

AUTHORS: Silvia Kolossa 1, Nicole Thiele 1, Johanna Walz 1, Mark A. Turner 2

AFFILIATIONS: 1 European Foundation for the Care of Newborn Infants, Munich, Germany
2 University of Liverpool, England

CONTENT:

Randomised controlled trials are the gold standard in neonatal research. However, due to the enormous amount of data documented in hospitals and doctor’s offices, and the possibility to collect data via electronic devices, real world data (RWD) are available from large cohorts. These data can be used to study therapeutic responsiveness or long-term outcomes without the need for expensive randomized controlled trials. As a European umbrella foundation for parents of preterm and ill infants, we were interested in the parents’ opinion on research using RWD of their newborns.

In March 2018, we conducted an anonymous online survey among European parents (n=301), on their knowledge of RWD and their willingness to provide their children’s data for this kind of research. The survey was disseminated by national parent organisations.

Only about 8% of the parents actually had heard of the term “Real-World-Data”, out of which only two-thirds knew the correct definition. Once the term was explained, 98% would agree to provide anonymous data of their newborns. 91% would additionally be willing to provide their children’s data for long-term follow-up, e.g. up to 3 years. However, only 14% had ever actually been asked to participate in RWD studies and all of them gave their approval. Parents’ preference regarding data acquisition was to give data during the visits at the doctor’s office, while the least favourite option was via the insurance claims. In the parent’s point of view, such data should especially be used to define health outcomes, which are meaningful to patients and families as well as for measurements of long-term health outcomes.

Although there is a lack of knowledge on the term RWD in parents, a high interest in the topic was expressed; the vast majority of them supports the RWD collection and analysis, especially for studies on health outcomes. Researchers and parents should therefore work closely together and use the opportunity of this win-win situation; make use of large data sets for research and on the long-term improving the health outcomes of newborns.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 836

**TITLE:** BRONCHOPULMONARY DYSPLASIA ASSOCIATED PULMONARY HYPERTENSION (BPD-PH) IN PRETERM INFANTS: EXPERIENCE FROM A TERTIARY NEONATAL UNIT

**AUTHORS:** Nicola Boyd 1; Sarah Kent 2; Mrinalini Rajimwale 3; Prakash Satodia 4

**AFFILIATIONS:** 1,2,3,4: Neonatal Intensive Care Unit, University Hospitals Coventry & Warwickshire NHS Trust, Coventry, UK

**CONTENT:**
Advances in neonatal medicine have led to increased survival of extremely preterm infants below 28 weeks gestation. This may lead to increased incidence of pulmonary hypertension associated with bronchopulmonary dysplasia (BPD-PH). BPD-PH poses a management conundrum for treatment of patent ductus arteriosus (PDA) in such cases. The role of PDA in pathogenesis of BPD-PH remains unclear. There is no strong evidence for the management of these babies and mortality remains high.

The clinical features and outcome of four premature babies including antenatal, labour, delivery and postnatal course, were reviewed retrospectively. Data was collected on severity of respiratory disease, cardiovascular status, sepsis episodes, intraventricular haemorrhages (IVHs), retinopathy of prematurity (ROP) and surgical necrotizing enterocolitis (NEC). The size and flow pattern of PDA at different time intervals were analysed along with timing and severity of BPD-PH.

All 4 female babies had antenatal steroids & magnesium sulphate, 3 were born by Caesarean section & 1 by vaginal delivery. Two had intrauterine growth restriction. One was a surviving triplet.

All were ventilated at birth, 1 needed high frequency oscillation. Three had post-natal steroids. Average corrected gestational age (CGA) at 1st successful extubation (>24 hours off ventilation) was 29 weeks (range 27-31).

All had PDA on ECHO scan in first 48 hours. PDA persisted until discharge/death. Bidirectional ductal flow persisted in all babies throughout admission.

Babies A & B died at CGA 46 & 50 weeks respectively despite treatment with oral sildenafil, dexamethasone and montelukast due to severe respiratory decompensation. Baby C remains on the HF at CGA 12 weeks pending duct ligation. Baby D had PDA closure at CGA 41 weeks.

BPD-PH incidence may be increasing and pathogenesis remains poorly understood. Such babies have significant morbidity and mortality. The impact of early PDA ligation remains unclear. There is little evidence for treatment using sildenafil (action) and further research is required for pulmonary vasodilation therapy.

**IMAGE / TAB:**
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**IMAGE / TAB CAPTION:** Table 1 – Summary of Co-morbidities in study population

**COI:** None declared
ID: 845
TITLE: HEPATIC FETAL CALCIFICATIONS
AUTHORS: Elena Portinaro 1, Roberto Conturso 2, Laura Guzzetti 3, Stefano Fiocchi 4, Giovanni Ciraci 5, Cristiano Malorgio 6, Daniele Merazzi 7
AFFILIATIONS: Ospedale Valduce, Como, Italy
Università Tor Vergata, Roma, Italy

CONTENT:
Definition: fetal hepatic calcifications are hyperechoic areas similar to bone tissue that are usually found during the II trimester screening between 18°-23° week PMA. Incidence: 1:750-2000 live fetuses, 33:1500 in spontaneous miscarriages. Localization depends on etiology. Carroll and Maxwell classification: PERITONEAL consequence of meconium peritonitis, PARENCHYMAL linked to tumors and infections, VASCULAR linked to thrombosis or hepatic ischemia. Ascites is a negative prognostic predictive sign. Isolated calcifications have good outcome; multiple and associated to other malformations and cromosomopathies (trisomy 13 and 21) have poor prognosis.

We describe a case of a male fetus with occasional finding at morphological US scan (at 20+3 w PMA) of calcifications surrounding the outer margin of the liver of 3.8 x 1.72 cm; normal morphology, regular growth (BPD: 49.1 mm, 67th cent; CC: 179.1 mm, 45th cent; CA 138.8 mm, 9th cent; femur length 31.8 mm, 44th cent; Estimated fetal weight (Hadlock 4) 307 g, 14th cent. Toxoplasmosis, CMV, Parvovirus B19 serologies were found to be negative, the mother underwent amniocentesis: 46 XY karyotype and she was followed by US controls at 21+4 w PMA that confirmed the hyperechogenic area apparently covering the whole hepatic surface measured 3.13 x 1.39 cm. At 23 + 5 w PMA control intestinal micro-calcifications were also evident. The fetus presented regular growth at 23+5 w, CA: 179.8 mm, 28th cent; CA at 30+3 w PMA 71st cent; CA at 34+3 w PMA 294.3 mm, 54th cent. A CS was programmed at 39 w PMA (because of previous CS and patient’s refusal to try VBAC). The newborn showed normal adaptation to extrauterine life; umbilical cord with 3 vessels, venous pH and BE at birth normal. Biochemistry of neonatal blood showed normal hepatic profile. The first abdomen ultrasound was performed at 1 day of life and confirmed the presence of "rosary-crown" calcifications on the glissonian surface and normal remaining abdominal anatomical findings. The child was discharged at the 4th day of life in good conditions. A second ultrasound was repeated at one month of life and confirmed the preview. He is waiting for MRI. The ultrasound examinations were carried out with the Samsung WS 80 device.

Calcifications are clusters of calcium salts with small amounts of other minerals. They are frequently found in sites of damaged tissues. Fetal tissues rapidly undergo calcifications because the fetus has a metabolic structure of hypercalcemia linked to the suppression of parathormone and acidosis (depending on gestational age). The topography of the fetal hepatic calcium repositories is determined by two etiological components:
1. Vascular compromise (with edema): the fetal hepatic vascular support is given by the hepatic artery and the portal vein. The latter receives highly oxygenated blood directly from the umbilical vein. Locally pO2 chance greatly and this phenomenon is particularly showed in the surface.
2. Gestational age: pH increases with gestational age

In the final analysis the pathophysiology of hepatic calcifications occurring in the second trimester is different from that of the III trimester. In the II trimester the acidosis conditions in particular at the subcapsular level promote the deposition of mainly superficial calcium salts while the typical coagulative pattern of the III trimester would favor the calcium deposit in periportal areas.

IMAGE / TAB:
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IMAGE / TAB CAPTION: Fetal liver calcifications at different gestational ages.

COI: no conflict of interest to declare
ID: 861

TITLE: The burden of viral respiratory tract infections in the NICU: A regional population study

AUTHORS: Chiara Taylor 1, Shin Tan 2, Don Sharkey 2

AFFILIATIONS: 1 Neonatal services, Nottingham University Hospitals NHS Trust
2 Academic Child Health, University of Nottingham

CONTENT:
Hospital-acquired viral respiratory tract infections (VRTIs) can cause significant morbidity and mortality in NICU infants. We’ve previously shown that VRTIs on the NICU are associated with escalation of respiratory support, increased length of hospital stay, increased need for home oxygen and higher healthcare costs (Zinna et al, Pediatrics 2016). No study has provided in-hospital population estimates of VRTIs and compared these to the NICU to truly understand the rate of nosocomial acquired infections in neonates. The aim of this study was to quantify the burden of hospital-acquired VRTI in our NICU population and compare this with other inpatient age groups in the same region.

We collected data on all positive viral respiratory samples by polymerase chain reaction (PCR) on inpatients within our institutions hospitals in Nottingham, UK, between 2007 and 2013. This included the H1N1 pandemic period. Nottingham University Hospitals NHS Trust has two tertiary centre hospitals, each with two level 3 NICUs, and serves a Nottinghamshire population of approximately 4 million. Patients were stratified according to age group. Positive results on the NICU were compared with the total NICU admissions (>4 hours) over this period to give a rate. For the other age-groups we used local population estimates from the Office of National Statistics to determine a rate. Comparison was also made between seasons (‘Warm’ April to September and ‘Cold’ October to March).

A total of 6924 cases of PCR positive VRTI were identified over the 6 years, excluding duplicate patients. The rate of infection was highest in the 0-1s with a rate of 61/1000 followed by the NICU population at 17/1000 (see table). Rhinovirus was the most common virus overall particularly in the NICU population. Amongst all age groups, there was a two- to three-fold increase in rate of positive samples in the winter months with rates during the warm months of 0.36/1000 population compared to 1.06/1000 in the cold months. However, the rate remained the same in the NICU during both warm and cold months (4.27/1000). Although only small numbers, the rate of H1N1 VRTIs on the NICU was almost 20 times higher than all other populations age 5 and over.

Rates of nosocomial VRTI in the NICU population are worryingly high, only second behind 0-1 year olds. There appears to be no seasonal variation in infections, unlike with older patients, with rhinovirus accounting for 75% of infections. Pandemic flu also appears to be a significant risk in the NICU. VRTIs are associated with significant morbidity and mortality in the NICU, requiring more research to understand how we can minimise these.

IMAGE / TAB:
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=d0041c9ce80bd16511d9f6d0fc4b7c03-MjAxOS0wNSM1Y2UyNjY2ZDEwN2Uw

IMAGE / TAB CAPTION:

COI: None declared
ID: 863
TITLE: RNA-binding motif protein 3 is altered by neuroblastoma differentiation and promotes cell migration
AUTHORS: Jingyi Yan; Xinzhou Zhu; Andrea Zelmer; Sven Wellmann
AFFILIATIONS: Neonatology Dept., University Children's Hospital Basel, University of Basel, Basel, Switzerland

CONTENT:
Cold-inducible RNA-binding motif protein 3 (RBM3) is expressed widely and dynamically regulated in the developing brain. The roles of RBM3 in the regulation of cell morphology, motility in neuroblastoma is still unclear. Deregulated migration could represent an oncogenic in neuroblastoma development. Thus, to investigate the function of RBM3 for proper migration provide hints to neuroblastoma development.

The cell migration was analyzed by wound healing assay in cell lines: BE(2C), Kelly, LAN1, SH-EP, SK-N-AS, SK-N-SH and SH-SY5Y. Monolayer cells were scratched with pipette tip and cell migration was photographed at 0, 6, 12 and 24 hours after scratch. The cell self-renewing capabilities were assessed using spheroid formation assay. Spheroid cells were generated in a serum-free environment for seven days, then calculated spheroid number and size. Cell lines differentiation were induced by adding 10μM retinoid acid to the cell culture medium. Cells were harvested for western blot analysis after 1, 3 and 5 days’ induction.

The wound healing assay suggested that BE(2C), LAN1 and SH-SY5Y cell lines with higher endogenous RBM3 migrated faster than the other cell lines. When silencing RBM3 expression by different specific siRNAs in SH-SY5Y, wound healing assay presented a weak and slow migration compare to scramble control. In contrast, when over-express RBM3 in SH-SY5Y, cells migrated faster than the vector control. These results were confirmed by spheroid formation assay. Moreover, retinoid acid induced differentiation showed that mycn amplified neuroblastoma cell lines, which indicate poor prognosis, presented a gradually increased RBM3 expression. On the contrary, mycn non-amplified cell lines presented decreased RBM3 level after differentiation.

We found that RBM3 promotes neuroblastoma cell lines migration and proliferation. RBM3 expression level presented opposite regulation in different mycn phenotype neuroblastoma after differentiation. Our data suggest that RBM3 might be implicated in neuroblastoma development by regulates cell migration and differentiation.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None declared
ID: 866
TITLE: IS A BABY BORN WITH FEMALE GENITALIA REALLY A FEMALE?
AUTHORS: Gökçe Eser 1; Mustafa Berber 2; Filiz Bakar 3
AFFILIATIONS: Yeditepe University Faculty of Medicine, İstanbul, Turkey

CONTENT:
The embryo is sexually undifferentiated during the first 6 to 7 weeks of development. Gender development in the male fetus is an active process. For the differentiation of the internal genital tract in the male fetus; the regression of Mullerian duct and the differentiation of Wolffian duct is necessary. The Mullerian ducts regresses with the effect of anti-mullerian hormone. Up to 6% of testosterone is transformed into a more potent androgen, dihydrotestosterone, by the enzyme 5 alpha-reductase in target tissue cells. This transformation is critical for sexual differentiation.

We, hereby represent a case diagnosed with 5 alpha-reductase deficiency.

A healthy female baby was born with caesarean section. In history of the mother’s previous pregnancies there was 8 unsuccessful in vitro fertilization (IVF) attempts. The final IVF attempt in which donor egg was used due to low maternal ovarian reserve had been successful. Since the mother did not want to have second trimester screening tests including amniocentesis, fetal DNA was examined from the mother’s blood, revealing a chromosomal analysis of 46 XY. However, the fetal ultrasonography revealed an external genitalia compatible with female phenotype. A second blood sample was sent from umbilical cord for karyotype analysis. On physical examination of the baby, although physical examination of the genitalia was in female appearance, the testes were palpated within the labia majora. Baby’s blood hormone tests were; FSH:5,9 mIU/ml, LH:16,7mIU/ml, testosteron:2,1mIU/ml. In the pelvic ultrasonography testis and epididymis were observed under labial folds. Umbilical cord blood karyotype was also resulted as 46 XY. Liquid chromatography–mass spectrometry panel for further analysis, resulted as normal. On genetic analysis, 5 alpha reductase enzyme deficiency was diagnosed.

This case has two interesting properties. Although most of this deficiency diagnosed late because of amenorrhea, virilization and lack of secondary sex characteristics, this case is almost diagnosed prenatally. And the other part is the autosomal recessive pattern of this deficiency occurring with a donor egg who has no consanguinity with the parents. Early diagnosis has important role for the quality of life of these children in the future.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: none declared
ID: 869  
TITLE: NEONATAL CRANIAL ULTRASOUND: A HELPFUL TOOL IN NEONATAL MENINGITIS  
AFFILIATIONS: Neonatal Intensive Care Unit, Neonatal and Pediatric Critical Care Department, Verona University Hospital, Italy  

CONTENT:  
Neonatal bacterial meningitis is a common manifestation in Late Onset Sepsis (LOS) in preterm infants. Microbiological diagnosis is not always possible because sometimes lumbar puncture cannot be performed and antibiotic therapy is started before CSF samples. However the certainty of bacterial meningitis allows to establish optimal treatment duration. Cranial ultrasound (cUS) has an important role in the assessment and follow up of neonate with clinical suspicion of bacterial meningitis. Typical cUS findings are echogenic sulci, ventriculitis, infarctions, fluid collections, abscess and complications such as encephalomalacia, hydrocephalus and intraventricular septation.  

A preterm female infant (GA=29d BW=1050 g) was born by C-section for pre-labour rupture of membranes (PPROM) and spontaneous preterm labour after bicorial biamniotic pregnancy with fetal reduction at 19 weeks of gestation. Antenatal steroids were provided. At birth, the baby had good cardiovascular adaptation with respiratory distress syndrome treated with CPAP. At 10 days of life she underwent a septic shock episode treated with empiric antibiotic therapy (vancomycin, amikacin and ceftazidim). The collection of CSF samples was possible only after few days because of thrombocytopenia. On the day 11, the baby presented electrical seizures refractory to first line antiepileptic drug and continuous infusion of midazolam was associated successfully. Blood and CSF cultures were negative and only percutaneous catheter cultures was positive for Staphylococcus epidermidis. After twenty hours the first cUS showed infarction with loss of gyral morphology in the right side. Serial cUS were performed daily in the first week showing the progression of the lesion into venous infarction, extra-axial fluid collection and finally bilateral encephalomalacia. The damage involved particularly the white matter with ex vacuo hydrocephalus due to liquefactive ischemic necrosis and it lead to septae development because of the ventriculitis. The length of treatment was tailored not just on microbiological samples but on neuroimaging.  

LOS often appear as neonatal meningitis. cUS is an excellent screening tool in evaluation of sick neonates at bedside and has high accuracy in evaluating initial signs as well as complications of meningitis. In our case, cUS was helpful for diagnosis and detection of serious complication as well as antibiotic therapy length. Getting an expertise in cUS could have an important value in meningitis management in this vulnerable population.  

IMAGE / TAB:  
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IMAGE / TAB CAPTION:  

COI: none declared
DIAGNOSTIC CONSIDERATIONS IN A PREMATURE NEONATE WITH RESPIRATORY DISTRESS AND FATAL LACTIC ACIDOSIS.

Authors: Georgia Zissimopoulou 1; Paraskevi Papadogeorgou 2; Alexandra Papadopoulou 3; Petros Vlastarakos 4; Aikaterini Fotiou 5

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Content:
Lactic acid is produced in physiologic processes as well as in disease states. When increased production is accompanied with decreased clearance, the severity of the clinical course escalates. High levels of lactate are associated with increased risk of death, independent of organ failure and shock. The most common causes of primary lactic acidosis in the neonatal period are inborn errors of metabolism. Secondary lactic acidosis results from tissue hypoxia, due to asphyxia, respiratory distress syndrome, cardiogenic or septic shock, and massive hemorrhage.

A 33 weeks gestational age and 1845gr, male infant, of a secundipara 31 years old mother was delivered by cesarean section due to premature rupture of membranes 5 days before the onset of labor and absence of amniotic fluid. Past maternal medical history included a urinary tract infection, which had been treated with antibiotics, and an upper respiratory tract infection one week before labor. Antenatal echocardiography had shown the presence of golf ball sign. Nevertheless, prenatal screening was unremarkable. Apgar score was 8 and 9 at 1 and 5 min. Cord gas values were normal, although secondary apnea presented at 2 min of life and the neonate was supported with positive pressure ventilation (n-CPAP).

On admission in the NICU, the neonate was irritable with mild chest retractions that progressively worsened. During the first hour of life, while the neonate was treated with n-CPAP PEEP 5.5 cmH2O and FiO2 40%, capillary blood gas analysis showed severe lactic acidosis (PH 7.08, pCO2 43mmHg, pO2 26.8mmHg, HCO3 10.8mmol/L, BE -18.7mmol/L, lactate 101mg/dl, Gic 64mg/dl, Na 140meq/l, K 5.4meq/L, Hb 13.6mg/dl). Chest X-ray depicted signs indicative of respiratory distress syndrome and mechanical ventilation was started. Two doses of surfactant, caffeine and antibiotics were also administered. Rest laboratory investigations revealed initially low neutrophil levels that subsequently normalized, while C-reactive protein and blood cultures were negative. However, the clinical condition constantly deteriorated, and an increase in FiO2 of 90% was mandatory even though different modes of ventilation support were used (Assist/Control, High Frequency Oscillatory Ventilation). Consecutive blood gas analyses revealed persistent uncompensated severe lactic acidosis (PH 7.082, pCO2 40mmHg, pO2 35.1 mmHg, Lac 127 mg/dl, HCO3 9.8mmol/l, BE -20.5mmol/l, Hb 12.2mg/dl).

Sodium bicarbonate, dopamine fresh frozen plasma and red blood cell transfusion were also administered. In addition to the diagnostic approach, a series of cranial ultrasounds revealed the presence of bilateral intraventricular haemorrhage grade II with an ischemic infarction in the left hemisphere. In spite of the intensive care management the neonate collapsed and died 15 hours after delivery.

Severe lactic acidosis, the first 24hours of life, is a challenge for a neonatologist due to diagnostic and therapeutic dilemmas that may arise. No clinical features are specific for primary and secondary hyperlactatemia. Antenatal metabolic screening is essential for genetic counseling. Based on literature, empirical initiation of prostaglandin E1 may be essential for neonates with extreme metabolic acidosis until cardiac disease is excluded.
IMAGE / TAB CAPTION:

COI: None declared
ID: 897

TITLE: CYSTIC FIBROSIS IN AN EXTREME PRETERM INFANT

AUTHORS: Dr Andrea Warnock 1
Dr Derek Huffadine 2
Dr Nigel Ruggins 3

AFFILIATIONS: 1 Neonatal Intensive Care Unit, Queens Medical Centre, Nottingham University Hospitals NHS Trust, Nottingham, England
2 Paediatric Department, Royal Derby Hospital, University Hospitals of Derby and Burton NHS Trust, Derby, England
3 Paediatric Department, Royal Derby Hospital, University Hospitals of Derby and Burton NHS Trust, Derby, England

CONTENT:
Cystic fibrosis (CF) is an autosomal recessive condition, with a recognised new-born screening programme. Despite this there is little outcome data on preterm CF patients. One study reports a 3 fold greater risk of premature birth with CF. A literature search revealed only 3 reports, relating to 7 preterm infants with CF. Only 2 survived to discharge: a 24 week DCDA twin with significant respiratory disease; and a 32+4 week infant with abdominal manifestations. All patients had ∆F508 mutation and significant respiratory disease. Our case adds to evidence suggesting preterm CF patients have a high mortality rate and consideration is needed to management strategies that promote survival chances.

A male baby, weighing 1.065kg, was born by normal vaginal delivery at 27+1 weeks gestation following an uncomplicated pregnancy with a normal antenatal anomaly scan. Mum went into spontaneous preterm labour and was delivered at a local level 2 unit following 1 dose of steroids. He required intubation at 6 minutes of life due to poor respiratory effort, and received a dose of endotracheal surfactant before being transferred to the neonatal unit. He remained ventilated for the first 8 weeks of life, following 3 trials of extubation which were unsuccessful due to ongoing significant respiratory compromise. On day 8 he was successfully extubated onto non-invasive support (CPAP) and over the course of the next 39 days he was gradually weaned off non-invasive support so that he was only requiring 4 hours of CPAP in a 24 hour period.

During this time he was diagnosed with a large, non-haemodynamically significant PDA on echocardiogram (ECHO), which was managed conservatively. On day 30, along with being treated for suspected sepsis, his oxygen requirement increased and a repeat ECHO revealed a haemodynamically significant PDA for which he received a treatment course of paracetamol; with evidence of improvement on repeat ECHO. On day 16 of life the results of his new-born blood spot (Guthrie) test were available, which revealed he was homozygous for the ∆F508 cystic fibrosis mutation. Confirmation via sweat test was not possible due to his corrected gestation and weight. He was referred to the local CF team for review and support.

During the first 48 days of life he was treated for suspected sepsis a total of 4 times, with no positive microbiology. During each episode he had deterioration in respiratory status requiring increasing non-invasive support, but not needing intubation. He had bilateral patchy consolidation on chest x-ray throughout, and each time received a course of intravenous antibiotics with signs of improvement in respiratory status. On day 28, along with antibiotic treatment, he was commenced on regular diuretics as supportive PDA management, this resulted in hyponatremia requiring oral supplementation. Despite commencing and tolerating full enteral feeds of expressed breast milk, he was observed to have poor weight gain. Faecal elastase level was low and he was commenced on pancreatic enzyme supplements (Pancrex) to support his growth, with good effect. He was also commenced on prophylactic Flucloxacillin with the aim of avoiding respiratory infections. He had normal cranial ultrasound scans.

On day 48 of life he had a significant respiratory deterioration requiring re-intubation, and had rapidly increasing oxygen and ventilation requirements. He was transferred to a level 1 neonatal unit on the same day where he commenced high frequency oscillatory ventilation with nitric oxide therapy and his antibiotic therapy was maximised to include Tobramycin and Ceftazadine, later Erythromycin and Caspofungin.
Despite maximal ventilatory support he failed to show significant signs of improvement; therefore in discussion with respiratory physicians he was treated with nebulised hypertonic saline, Dornase alpha (DNAse) and a course of Dexamethasone with the aim to treat underlying lung disease due to prematurity and cystic fibrosis. During this time he was commenced on parenteral nutrition and was fully sedated and muscle relaxed. He maintained a good urine output with normal renal and liver function. He did not require inotropic support. His repeat cranial ultrasound revealed a small localised IVH.

No positive microbiology, including bacterial studies and respiratory viruses were detected, a beta D glucan result was equivocal. Chest x-rays continued to show bilateral patchy consolidation along with hyperinflation.

On day 52, discussions with the family centred on the ceiling of treatment, and on day 55 these discussions concluded that there were no further treatments we could offer. Despite maximal therapy we were seeing no signs of improvement, and comfort care measures were initiated. On day 56 of life the decision was made to withdraw intensive care and he passed away peacefully in his parents arms.

Published evidence relating to the management of preterm babies with CF is lacking. A small number of case studies, including ours, show a very high mortality rate.

New-born screening means we can now pick up these cases early, potentially before symptoms develop.

This case adds to the evidence of those already published; and highlights the need for further investigation into the management of preterm babies with CF, to maximise survival chances.

IMAGE / TAB:

IMAGE / TAB CAPTION:

COI: None Declared
ID: 899

TITLE: REVIEW OF RESPIRATORY SUPPORT STATUS FOR EXTREMELY PRETERM INFANTS IN TERTIARY LEVEL NEONATAL UNITS ACROSS ENGLAND

AUTHORS: Rashmi Gandhi 1
Mark Sellwood 2

AFFILIATIONS: King’s College Hospital NHS Foundation Trust
University College Hospitals NHS Foundation Trust

CONTENT:
Respiratory morbidities for very low birth weight babies have largely remained unchanged. Early extubation can reduce length of stay in preterm babies (Robbins M 2015). Recent survey of respiratory support showed considerable variation in respiratory management across neonatal units (Sharma A 2017). Daily respiratory management data is routinely collected nationally in UK for all babies cared for in neonatal units and stored in Neonatal Data Analysis Unit (NDAU).

Hypothesis: National data of respiratory management can easily be extracted from NDAU to compare the respiratory care, improve practice in neonatal units and in clinical networks and identify and share good clinical practice.

Anonymised data held within the NDAU was used for this study. Respiratory management data for babies <26+0 weeks gestation cared for in English neonatal units between 1st January 2016 to 31st December 2016 was extracted. Mode of ventilation at day 7, 14, 30 and at 36 week corrected gestation (CGA) in surviving neonates were compared across all neonatal units. Rates of bronchopulmonary dysplasia defined as oxygen requirement at 36 weeks CGA was also derived.

Statistical method used: Student’s T test. This study was ethically approved by London-Queen Square Research Ethics Committee.

A complete respiratory data of 1,036 babies was obtained from NDAU. Survival to discharge was 52%, 69% and 79% for 23, 24 and 25 weeks gestation respectively. Overall mortality was 30%. Death was significantly higher in babies who did not receive antenatal steroids (p: 0.003).

Average length of invasive ventilation in the whole cohort per unit varied from 4 days to more than 30 days. A very high proportion of babies continued to be invasively ventilated at the end of first week of life. This continued in the 23 and 24 week GA babies till day 30 of life. (73% and 49% invasive ventilation respectively). Rates of bronchopulmonary dysplasia reflected the need for invasive ventilation. Length of stay was significantly shorter in babies extubated earlier (p: 0.001) (excluding deaths).

Ventilation data is readily extracted from routinely acquired NDAU data that allows individual NNUs to compare their own performance against national averages and other individual units. The variations demonstrated in initial respiratory support may have implications for these infants on length of stay and long-term outcome.

IMAGE / TAB:
https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=2a959aead7d26943811b171b8f281d95-MjAxOS0wNSM1Y2UyNjY2ZDFINjQ1

IMAGE / TAB CAPTION: Ventilation status of babies born < 25 weeks gestation (%) 2016 NDAU data

COI: nil
ID: 900

**TITLE:** THE PROPORTION OF BABIES RECEIVING ANTIBIOTICS FOR EARLY ONSET SEPSIS CAN BE REDUCED BY USING A SEPSIS CALCULATOR

**AUTHORS:** Adam King  
Laura Croucher  
Charlotte Weeks  
Sarah Davidson  
Mike Hall

**AFFILIATIONS:** Department of Neonatal Medicine, Princess Anne Hospital, University Hospital Southampton NHS Foundation Trust, Southampton, UK

**CONTENT:** Early Onset Sepsis (EOS) describes infection in the newborn developing before 72 hours. NICE Guideline 149 advises criteria for starting treatment for EOS, but subsequently some infants have no evidence for EOS on investigation. An EOS probability calculator has been shown to reduce the proportion of babies in the USA exposed to antibiotics for EOS. We hypothesise that applying the calculator to each baby at 35 weeks’ gestation, and over in a UK maternity unit, the proportion receiving antibiotics for EOS could be reduced.

Electronic clinical and laboratory records were used to identify inborn babies who received antibiotics for EOS in a 3-month period from June-August 2018 using the (then current) guidelines based on NICE CG149. All babies born at 35+0/40 and above were included. From September 2018, the Kaiser Permanente EOS calculator replaced the local CG149-based decision-making tool regarding starting antibiotic treatment. A comparison of frequency of antibiotic treatment and positive blood cultures in the first five months (September 2018-January 2019) following the introduction of the calculator was made with the three months preceding introduction.

In the 3 months June – August 2018, 151/1323 (11.4%) received parenteral antibiotics for treatment of suspected EOS. During the period September 2018 – January 2019, following implementation of the EOS calculator, we saw a reduction to 169/2208 (7.6%) of infants received parenteral antibiotics (p=0.0002; Chi squared test). In the pre implementation period 2 infants had Group B Streptococcus (GBS) positive blood cultures. Neither met criteria for starting antibiotics using either CG149 or the EOS calculator, but both met criteria for observation and monitoring. Following implementation 3 infants had positive blood cultures for GBS. None of these were identified as at risk by either screening system. All 3 presented clinically unwell within the first 72 hours, and received empirical antibiotics based on symptoms and abnormal observations.

Implementing an EOS calculator to a UK hospital is feasible, and results in a significant reduction in the proportion of babies born at 35/40 and above receiving antibiotics for EOS. Although neither system detects all cases of EOS there have to date been no cases of sepsis missed by the calculator compared to CG149.

**IMAGE / TAB:**

**IMAGE / TAB CAPTION:**

**COI:** None Declared
ID: 915

**TITLE:** ORBITOFRONTAL REALITY FILTERING IN PRETERM CHILDREN: TOWARDS A BETTER COMPREHENSION OF THE IMPACT OF PREMATURITY ON ORBITOFRONTAL FUNCTIONS

**AUTHORS:** Maria Chiara Liverani 1; Lorena Freitas 1,2; Vanessa Siffredi 1,2; Cristina Borradori Tolsa 1; Russia Ha-Vihn Leuchter 1, Armin Schnider 3, Petra S. Hüppi 1

**AFFILIATIONS:**
1 Department of Pediatrics, Gynecology and Obstetrics, Division of Development and Growth, University of Geneva, Switzerland
2 Institute of Bioengineering, École Polytechnique Fédérale de Lausanne, Switzerland
3 Department of Clinical Neurosciences, Division of Neurorehabilitation, University of Geneva, Switzerland

**CONTENT:**
Prematurity can lead to brain abnormalities, with negative consequences on cognitive development. The orbitofrontal cortex (OFC), a crucial region for adaptive behavior and top-down cognitive control, is highly vulnerable in the preterm population. Nevertheless, a deep understanding of the function of OFC in the context of prematurity is missing. Orbitofrontal Reality Filtering (ORFi) is a memory mechanism that distinguishes if a thought is relevant to present reality or not. In adults and teenagers, it is mediated by the OFC. Using a recognition task assessing ORFi, we compare preterm to full-term children, in order to better elucidate the function of OFC in the developing preterm brain.

Thirty-five preterm children (born < 32 weeks of gestation) and 25 full-term children were included in the study. Participants were asked to perform a memory task composed of two runs: run 1 measuring recognition capacity and run 2 measuring ORFi. Each run contained two types of images (conditions): 1) distractors (D: images seen for the first time in the current run) and targets (T: images seen for the second time in the current run). Behavioral data and functional magnetic resonance images (fMRI) were acquired during the task. Repeated measures ANOVA on accuracy and reaction time were performed. For the imaging data, whole-brain analysis using SPM12 and group region of interest (ROI) analysis on the OFC using a 3-way ANOVA (with the factors “group”, “run” and “condition”) were performed.

Preliminary analyses on behavioral data showed that children born at term have better performances in response to distractors than premature children (p < 0.05). No differences in the reaction times were found between the two groups. The whole-brain analysis on the neuroimaging data revealed a higher activation of the right OFC in control children compared to preterm children during the task (p < 0.03, FWE, Figure 1). Additionally, in the second run of the task the right OFC activation was higher in the control group than in the preterm group (p < 0.005, uncorrected). Finally, the ROI analysis showed that the overall bilateral OFC activation was higher in the control group compared to the preterm group while processing distractors of the second run, stimuli that specifically assess ORFi (p < 0.034).

These results confirm the hypothesis that prematurity can affect prefrontal and in particular orbitofrontal region not only from a structural but also from a functional point of view. Moreover, the study provides a valid experimental task that specifically targets this vulnerable region. The ORFi task allows to better understand cognitive problems linked to prematurity, and to disentangle orbitofrontal functions in this clinical population.

**IMAGE / TAB:**
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**IMAGE / TAB CAPTION:** Fig.1: Orbitofrontal activation of the control group versus preterm group during the Orbitofrontal Reality Filtering task (p < 0.03, FWE).

**COI:** None declared

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**Supported by:**

**Powered by:**
ID: 942
TITLE: Triploidy
AUTHORS: Jūratė Savickienė 1, Eglė Lysovienė 2, Rasa Tamelienė 3
AFFILIATIONS: 1 Department of Neonatology, Lithuanian University of Health Sciences, Eiveniu g. 2, Kaunas, Lithuania
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CONTENT:
Triploidy is a lethal chromosomal numeric abnormality, characterized on extra haploid set of chromosomes. Approximately 1-3% of conceptions are triploidy with the majority miscarrying in the 1st trimester. Term infant dies within the first days of life. Triploidy is estimated to occur in 1 of 3,500 pregnancies at 12 weeks’ and 1 in 250,000 at 20 weeks’ gestation. Infants affected with triploidy suffer from multiple birth defects. Triploidy may be prenatally diagnosed through cytogenetic analysis of cells obtained through amniocentesis or can be confirmed after birth by chromosome analysis of tissue obtained from the affected infant. Treatment is symptomatic and supportive.

We present a case of third-trimester triploidy diagnosed prenataly at our center. 26 years old gravida with a first spontaneous pregnancy had early gestational hypertension. Ultrasound examination in 22 weeks’ gestation revealed hydrothorax, hepatomegaly, short long bones of the extremities. An amniocentesis and cytogenetic analysis from amniotic fluid cells was performed in 26 weeks’ gestation. Result showed abnormal karyotype of the fetus (69,XXY triploidy). The infant was born vaginaly in 29 weeks’ gestation with a birth weight 1020 g. The Apgar scores were 6/8 at 1 and 5 min. Postnatally the condition was very severe, because of progressive respiratory distress. This didn’t improve after the patient was given noninvasive positive pressure oxygen therapy and installed surfactant. The infant was intubated and mechanical lung ventilation was started.

Physical examination showed micrognathia, chest wall deformities, hemangioma of the abdomen skin, ulnar deviation of the forearm, deformities of the toes and the gender was not clear.

Blood test results showed pancytopenia, high creatinine levels.

Brain ultrasound showed cerebellar warm and hemispheres hypoplasia, partial hypoplasia of corpus callosum, lysencephaly.

Abdominal ultrasound showed bilateral polycystic kidneys. Plain chest X ray showed only reduced lung expansion.

General condition of the infant was getting worse quickly. Hypoxemia progressed despite the ventilation with 100% oxygen. Bolus of fluid and vasopressors therapy because of hypotension didn’t have a significant effect. Oligoanuria was developing.

Blood gas analysis indicated respiratory and later metabolic acidosis.

Despite intensive care, the infant died surviving 1 day 10 hours 38 minutes.

Autopsy results confirmed all the previously clinically diagnosed anomalies, also intestinal malrotation was found.

Triploidy is not more common in older mothers, like some other chromosomal abnormalities. There are no risk factors. This case report highlights the importance of cytogenetic analysis and prenatal ultrasound in this congenital anomaly and chromosomal aberration of the fetus during the second trimester of pregnancy.

IMAGE / TAB:
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IMAGE / TAB CAPTION:

COI: None declared
ID: 946

**TITLE:** AN EXTREMELY RARE CAUSE OF RESPIRATORY DISTRESS IN TERM INFANTS.

**AUTHORS:** Euthimia Papacharalampous, Georgios Mitsiakos, Dimitra Gialamprinou, Ilias Chatziioannidis, Paraskevi Karagianni, Evgenyia Babacheva, Vasiliki Soubasi

**AFFILIATIONS:** Second Department of Neonatology, Aristotle University of Thessaloniki, “Papageorgiou” Hospital, Thessaloniki, Greece

**CONTENT:**
Respiratory distress in term infants can be caused from several but respiratory or systematic causes. Perinatal injuries due to traumatic delivery such as phrenic nerve paralysis can lead to diaphragmatic paralysis followed by respiratory distress. The aim of this was to describe the clinical course of an infant recovering spontaneously from diaphragmatic paralysis due to perinatal phrenic nerve injury without needing any surgical intervention.

We present a 4 days-old male newborn with a birth weight of 3620 grams who was born by normal vaginal route, with the usage of vacuum extraction. The immediate post natal period was uneventful. At 8th hour of life, the baby developed respiratory distress. He was started on oxygen application with max FiO2 30%. The chest X ray showed small right lung volume, asymmetry in hemidiafrags, blur findings in the base of the right lob. He was commenced on intravenous antibiotics for suspected infection and on parenteral nutrition.

After four days of no improvement he was shifted to NICU. The clinical evaluation beside the respiratory distress, revealed an asymmetric Moro reflex on the right arm and right caput succedaneum. The chest X-rays showed elevated right hemidiaphragm (Figure 1). The ultrasonography and the thorax-CT showed intact hemidiaphragms on both sides, but on the right side elevated right hemidiaphragm, and atelectasis. The examination which confirmed the diagnosis of diaphragmatic paralysis due to phrenic nerve paralysis was X ray fluoroscopy which showed diminished and paradoxical, non symmetric respiratory movements on the right hemidiaphragm. The neonate continued on oxygen application, antibiotics and IV fluids and showed gradually improvement of the respiratory function, without needing any further assistant. All laboratory results where negative for infection. The baby was discharged home after two weeks.

At 4 months follow up the baby continued to show satisfactory respiratory function and weight gain, as well as a normal neuromotive development (Figure 2). The new chest X ray showed now the two hemidiaphragms at the same level. The infant in our case report was among the minority of infants who suffered from diaphragmatic paralysis due to perinatal phrenic nerve injury and recovered spontaneously. According to the recent literature the majority of the infants fail to wean from ventilatory support and need surgical treatment. Those who undergo early plication have a quick recovery and can be extubated successfully within a few days.

As multiple neonatal pathologies may lead to respiratory distress, this rare cause of respiratory distress of newborn may be missed easily among multiple common etiologies of respiratory distress of the newborn if this entity is not kept in mind and thorough examination is not done.

**IMAGE / TAB:**
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**IMAGE / TAB CAPTION:**

**COI:** None declared
ID: 951
TITLE: BORN A LITTLE TOO EARLY
AUTHORS: Siobhan Hackett1; Kanwal Altaf, 2; Ireti Farombi3
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CONTENT:
In Ireland 6.5 % of the total live births are preterm. Late preterm infants (LPI) are infants born between 34+0 and 36+6 weeks gestation. These infants are prone to increased morbidity and mortality, compared to term infants, and hence may require admission to neonatal intensive care unit (NICU). Admission criteria for LPI vary between neonatal units in Ireland. Our current practice is to admit infants less than 36 weeks gestation. The aim of our audit was to review the care that infants born between 35+0 and 35+6 gestation receive in our NICU and to give consideration to changing admission criteria thereby reducing maternal-infant separation and over-medicalisation of these infants.

A retrospective chart audit was carried out on all infants born between 35+0 to 35+6 weeks gestation from September 2017 to August 2018. Charts were reviewed for medical and nursing care of these infants. Modalities reviewed include mode of delivery, birth weights, need for respiratory support, incubator care for thermoregulation, enteral feeding progression, hypoglycaemia, management of neonatal jaundice and administration of antimicrobials and length of stay. Infants with life-limiting conditions were excluded.

Sixty-nine charts were reviewed. 29(42%) infants were delivered by emergency caesarean section. The majority of babies had a birth weight greater than 2.0Kg. 15 (21%) babies required CPAP for respiratory support. More than half the infants had an admission temperature less than or equal to 36.5°C. 34 (47%) babies received enteral feeds on the first day of life with 31(45%) receiving breast milk throughout their stay. 30 (43%) infants were treated for hypoglycaemia. 19 (27%) infants were treated for jaundice, 35 (50%) infants received antibiotics, majorly for signs and symptoms of respiratory distress. The majority (n=59) of babies were placed in an incubator on admission to the NICU, with most of them in cot by day 2 of life. The longest length of stay was 26 days with the majority of infants discharged within two weeks.

This audit reflects the need for neonatal expertise to care for LPI. Significant neonatal morbidity is uncommon in LPI, but their care can impose an impact on NICU occupancy. With education and practice guidelines, care required by LPI may be provided in the postnatal ward (PNW), reducing maternal-infant separation and over-medicalisation of LPI. An exploration of the best care setting for these vulnerable infants is warranted.

IMAGE / TAB:

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COI: none declared
ULTRASOUND PATTERNS IN SEVERE PERINATAL HYPOXIC ISCHEMIC INJURIES OF PRETERM NEWBORN - CASE REPORT

Ligia BLAGA1, Camelia VIDRA2, Adriana CIUBOTARIU, Gabriela Abrudan2, Melinda MATYAS1, Monica HĂSMĂSANU1, Gabriela ZAHARIE1

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Hypoxic-ischemic encephalopathy is a well defined and easily recognizable syndrome in term newborn infants, while its definition, clinical features, evolution and complications are much more complex in the preterm infants. The incidence of hypoxic-ischemic lesions in premature infants is underestimated. They are accompanied by increased frequency of neurodevelopmental disorders, sensorial, attention and cognitive deficits, and behavioral disorders. The classical lesions described are periventricular leucomalacia and cerebral hemorrhage, with or without ventricular dilatation. Nowadays the association of lesions in the corpus callosum or basal nuclei are discussed.

We present the case of a premature infant born by cesarean section at 33 weeks of gestation, from a pregnancy with severe preeclampsia and HELLP syndrome; birth weight 1900 g, Apgar scores 1/3/5. Resuscitation at birth included positive pressure ventilation on oro-tracheal tube. Ventilator support was necessary for 48 hours, then nCPAP was provided; the baby also needed fluid replacement, vasoactive support, fresh frozen plasma and repeated correction of metabolic acidosis by bicarbonate administration.

The first cerebral ultrasound revealed peri/intraventricular hemorrhage, which occupied both lateral ventricles and the third ventricle; intraparenchymal and epidural hemorrhage; ischemic areas at the level of basal nuclei. At 2 weeks of age multiple cystic lesions in the periventricular white matter, extending to the subcortical area were noted. It associated rapidly progressive obstructive hydrocephalus.

Mechanisms that have favored brain damage are complicated: severe hypoxia and acidosis, hemodynamic disorders and cerebral ischemia, prematurity and also postnatal factors.
ID: 963
TITLE: CHANGES IN THE CONCEPT OF NEONATAL INTENSIVE CARE DECREASE MORTALITY AND MORBIDITY
AUTHORS: Éva Rita Czemmel 1, István Kocsis 2, Nándor Ács 3,
AFFILIATIONS: 1. Semmelweis University, Károly Rácz School of PhD Studies, Clinical Medicine, Budapest, Hungary
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CONTENT:
Infant mortality rate is an important statistical data describing the level of a country’s health and socioeconomic status. Premature birth is the biggest contributor to death under 1 year of age in developed countries. There has been a substantial change in the last 5 years in neonatal intensive care at our Department including the introduction of a non-invasive approach in delivery room stabilisation, in respiratory care and in surfactant administration. Furthermore, a strong cooperation has been established between neonatal and obstetrics services to prevent prematurity and for the optimisation of time of premature births in pathological cases of Very Low Birth Weight (VLBW) neonates.

Our presentation compares the statistics of mortality and morbidity of VLBW infants born before (2012, n=100) and after (2016, n=111; 2017, n=101) the introduction of the new concept. Gestational age, anthropometric parameters, parameters of respiratory care modes and incidence of surfactant administration, and the incidence of Bronchopulmonary Dysplasia (BPD) and mortality were compared retrospectively.

During the study’s years mechanical ventilation was administered for 687 days in 2012, 365 days in 2016 and 189 days in 2017. Surfactant administration was needed in 82 cases in 2012, 63 cases in 2016 and 58 cases in 2017 among the group of VLBW. The mode of surfactant administration technique was also changed in the investigated years, in most cases Minimal Invasive Surfactant Therapy (MIST) technique was used instead of INSURE (INtubation-SURfactant-Extubation). The prevention of prematurity, the high rate of antenatal corticosteroid administration, the prolongation of pathological pregnancies under thorough obstetric control results the average gestational age was changed from 28,6±3,25 to 29,6±2,8 weeks in years 2012 and 2017 and the average gestational weight was also elevated from 1056±306 to 1196±289 grams in years 2012 and 2017 respectively,

The team work between obstetricians and neonatologists and introduction of non-invasive neonatal intensive care resulted in significantly decreased in the incidence of BPD, as well as mortality rates from 14% in 2012 to 1% in 2017 in our Neonatal Intensive Centre.

IMAGE / TAB:
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IMAGE / TAB CAPTION: Distribution of invasive and non-invasive ventilation
COI: None declared
ID: 967

TITLE: THE RISK FACTORS OF EXTRAUTERINE GROWTH RESTRICTION IN PRETERM INFANT

AUTHORS: Gatot Irawan1; Ima Sonia2;

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CONTENT:

Extrauterine growth restriction (EUGR) defined as growth value (weight, length or head circumference) ≤ 10th percentile of the predicted value. Failure to thrive is a common problem in preterm neonates who are hospitalized in high risk room. This condition may lead to neurodevelopmental delay. The objective of the study is to analyze the risk factor of EUGR.

The study was cross sectional. Data were collected from hospital registry in 2017. Data included birthweight and weight at the end of hospitalization of neonates who were born and hospitalized in high risk room. Data were plotted in Fenton chart then categorized to normal or EUGR. Exclusion criteria including congenital anomaly, death during hospitalization and neonates born outside Dr. Kariadi hospital. There were 57 preterm neonates were analyzed in this study. Correlation study were analyzed using chi square test. Significance of the study with p<0.05.

Result

Conclusion

In 2017, there were 86 neonates born and hospitalized in high risk room, 57 of them were preterm. EUGR was found in 33 preterm babies (57.9%). Preterm baby significantly had risk developing EUGR (p=0.000). Gender and history of preeclampsia were not risk factor of EUGR. On the other hand, asphyxia is a risk factor of EUGR (p=0.019).

EUGR is a serious problem in preterm neonates,. The risk factor associated with EUGR is asphyxia.

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COI: no conflict of interest
NIFEDIPINE AS A TREATMENT FOR REFRACTORY NEONATAL HYPOGLYCEMIA IN HOSPITAL WITH LIMITED SETTING - A CASE REVIEW

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Hypoglycemia is commonly found among infants, which may occur transiently in glucose homeostasis adaptation, especially in infants born with perinatal stress and to diabetic mother. Pathologic endocrine conditions such as Hyperinsulinism Hypoglycemia (HH) might also be suspected in prolonged hypoglycemia. Diazoxide, octreotide, glucagon, steroids and calcium channel blockers are commonly used agents to treat this condition. Symptomatic or not, hypoglycemia requires prompt treatment to reduce neurologic impairment risk. In limited settings where establishment of diagnosis is not possible, aggressive treatment of refractory neonatal hypoglycemia should be performed regardless of the etiology.

A full term, 2980 gram female baby was born by C-section delivery to a diabetic multigravida mother. She was born vigorous with no dysmorphic features and physical examination was within normal limits. Upon routine laboratory examination, she was found hypoglycemic with blood glucose level of 28 mg/dL without any related symptoms. The initial hypoglycemia management was by administering intravenous bolus of dextrose 10% 2 mL/kgBW peroral, followed by dextrose 10% infusion with starting glucose infusion rate (GIR) 4 mg/kg/min and breastmilk ad libitum, along with regular monitoring of blood glucose levels. Intravenous dextrose was gradually increased up to 20 mg/kg/min but blood glucose levels remained low in every measurement. On the next day, nifedipine 0.5mg/kgBW every 12 hours was added orally and blood glucose level started to progressively rise and the euglycemic state was sustained. Intravenous glucose weaning was performed and nifedipine dose was maintained for the next 3 days without any side effects recorded. The oral nifedipine therapy was weaned by reducing the doses. However, the blood glucose level dropped and nifedipine was re-administered with the initial dose. The blood glucose level were stable during the monitoring and the patient was discharged on the fourth day with the same regimen of nifedipine. Three days post discharge, the patient was brought to pediatric outpatient clinic for routine follow-up without any symptoms reported and the blood glucose level was within normal range (135 mg/dl).

Nifedipine stabilised blood glucose level in refractory neonatal hypoglycemia. Albeit the etiology is unsettled, the most proposed mechanism is hyperinsulinism. In resource-limited hospital where diagnostic and therapeutic means are restricted, timely administration of calcium channel blocker might reduce the risk of prolonged hypoglycemic condition and subsequently the risk of neurodevelopmental impairment without serious side effects reported.
ID: 976
TITLE: OUTCOMES OF BABIES WITH BIRTH WEIGHT UNDER 500 GRAMS IN TWO BIRMINGHAM TERTIARY NEONATAL INTENSIVE CARE UNITS
AUTHORS: Ashley Vardon 1, Fateh Singh 2, Sandhya Santharam 3, Shree Vishna Rasiah 4, Anju Singh 5, Harsha Gowda 6
AFFILIATIONS: 1, 3, 6 Neonatal Unit Birmingham Heartlands Hospital, Birmingham, UK
2, 4, 5 Birmingham Womens' and Childrens' Hospital, Birmingham UK

CONTENT:
Recently there have been significant improvements in the survival of VLBW infants <1500 g and ELBW infants <1000 g worldwide. This has largely been a result of antenatal steroids, surfactant administration, invasive ventilation, nitric oxide and postnatal steroids. The limits of viability continue to decrease, however, medical and ethical issues surrounding extremely low birthweight infants remains highly controversial. There is greater clarity and guidance on gestational age for limits of viability as compared to weight criteria.

To evaluate the in-hospital mortality and morbidity in babies born under 500 grams in two large tertiary neonatal intensive care units in Birmingham.
Retrospective data was collected from Badger neonatal database over a 9-year period from April 2009 to March 2018 looking at the mortality and morbidity in babies with birth weight under 500 grams in two tertiary neonatal intensive care units across local maternity service.

There were 43 babies in the study cohort. There was a 42% survival. There were 16 males and 27 females, with higher mortality in males (81% versus 44% in females). 3 babies had oesophageal perforation with nasogastric tube which was managed conservatively. There were 16 babies who were diagnosed with necrotising enterocolitis but none had surgery. 20 babies had intraventricular haemorrhages with 9 grade 3-4. 12 babies with retinopathy of prematurity, only 2 requiring laser therapy. 7 of the surviving babies were discharged home on oxygen. The average hospital stay for the surviving infants was 109.5 days.

Our two-centre data shows that there is high mortality and morbidity of babies born with a birth weight under 500 grams, particularly in male infants. Antenatal counselling is often challenging in these cases on the cusp of viability, with larger datasets conclusions can be drawn on the management and outcomes in this group of infants.

IMAGE / TAB:

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COI: None declared
ID: 979

TITLE: VIDEO RECORDING OF RESUSCITATION AND STABILISATION OF NEWBORNS ON LABOUR WARD: SURVEY OF UK NEONATAL UNITS VIEWS

AUTHORS: Avineet Kaur 1; Marika Lasokova 2; Thomas Hixson 3; Jean Egyepong 4

AFFILIATIONS: 1-4: Neonatal department, Luton and Dunstable University Hospital, United Kingdom

CONTENT:
Neonatal stabilisation/resuscitation is a relatively common and important intervention. It requires a high level of performance and skilled human factors, awareness for good outcomes. Due to its highly stressful nature, recollections of events and learning during the intervention may be minimal. Therefore, video recording and review offers several advantages: more accurate timing and documentation of event, reduce recall bias, objective evaluation of competencies, use as a debriefing learning tool & quality assurance and improvement tool, compare performance with guidelines. A couple of NICUs currently use it for the above stated reasons although its use also poses several ethical dilemmas.

To evaluate
- The current use of video recording (VR) during resuscitation/stabilisation of newborns after delivery
- Reasons for its use

Method:
- Survey of practice in UK Neonatal Units that provide newborn resuscitation/ stabilisation after birth
- Date: April 2019
- Telephone survey
- Sister-in-charge/ ANNP/ ST1-3 or ST>3 on-call or shift or consultant on the day (member of the medical team)
- Questions:
  1. Video recording of newborn S/R on LW
  2. Whether this is part of standard practice
  3. What it is used for
- Solicited free comments on ‘The Use of Video Recording of S/R of Newborns at delivery’

- Only 2/196 units have used VR of S/R
  - 1 used it few months as trial in delivery room & NICU, for debrief/feedback/clinical learning; very costly equipment
  - 1 using it <1yr & Simulation training
  - None shared with parents and not saved
- 11 units use VR for Simulation training
- 1 stopped as caused anxiety for staff
- For training, learning & Human Factors; Not saved post debrief

Themes arising from comments:
- Positive views
  - Most objective retrospective way of assessing performance
  - Promote transparency of care/duty of candour
  - Improve and maintain: accuracy of documentation, record of events, debriefs learning and training, quality of care
- Barriers/concerns
  - Governance issues: Consent (family, staff, hospital organisation); Confidentiality; storage; medico-legal; ‘Blame-culture’ in case of adverse outcome
  - Equipment cost
  - Anxiety/Stress/pressure/distraction
  - Implementation difficulties
• Only 1 NICU in UK video record delivery room stabilisation/resuscitation
• Solely for education and training and not shared with parents
• The only other unit that trialled it did not however implement it
• Several positive view as well as barriers/concerns emerged on its possible use
• Remains to be seen if this practice will change in future considering its introduction and implementation as standard practice in some units in other countries

IMAGE / TAB:
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IMAGE / TAB CAPTION: Visual representation on views of UK neonatal units on video recording of resuscitation and stabilisation of newborns

COI: None declared
Hypoxic ischaemic encephalopathy (HIE) is a subset of neonatal encephalopathy (NE) associated with peripartum or intrapartum events. Currently there are knowledge gaps limiting clinician ability to distinguish HIE from other causes of NE. Placental pathology may aid in understanding aetiology of NE and correlation with outcome, however data available is sparse as placental examination is seldom requested for. We report a case of NE where placental pathology provided further information on the poor outcome.

Male infant born at 40+6 weeks gestation required full resuscitation following emergency caesarian section for absent heart rate on cardiotocograph. There were decreased fetal movements a week prior with failed induction of labour. He received therapeutic hypothermia and had neonatal seizures with multiorgan dysfunction including abnormal clotting, renal failure, persistent pulmonary hypertension and cardiac dysfunction. MRI brain showed extensive brain injury. Baby died following redirection of intensive care in view of poor neurological outcome.

Placenta initially was reported locally as normal, but specialist review showed placental dysmaturity with severe acute chorioamnionitis and fetal chorionic vessel vasculitis.

Discussion:
Placental dysmaturity or delayed maturation may cause sudden intrauterine death near term secondary to hypoxia. It is defined as delayed villous maturation for gestation where the terminal villi show a decreased number of vascular syncytial membranes, impairing placental respiratory function and thus causing birth asphyxia. Although only 2% of fetuses with a dysmature placenta will actually die, mortality risk is 70 times higher than a fetus with a normal placenta. There is also a 10-fold increased risk of recurrence in mothers who have previously had late intrauterine deaths. Often, there are no predictive signs of intrauterine stress and placental dysfunction manifests as a terminal acute event. It is commonly seen in infants of diabetic mothers. In addition, there was an ascending vaginal infection with maternal and fetal response that had also contributed to this baby’s poor outcome.

Adequate placental function is critical for fetal development and survival. Investigating the cause of pregnancy failure through placental examination is pivotal in understanding the systemic cause and risk of potential recurrence. Meticulous analysis of placental pathology helps in the assessment of NE and relationship to outcome. Larger studies are needed to further understand the relation between neurological dysfunction and placental lesions.