ID: 32  
TITLE: USE OF WEB-BASED GAME IN NEONATAL RESUSCITATION - IS IT EFFECTIVE?  
AUTHORS: Cheo Lian Yeo 1,2,3; Imelda Lustestica Ereno 1; Selina Kah Ying Ho 1,2,3  
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2 Yong Loo Lin School of Medicine, National University of Singapore, Singapore  
3 Duke-NUS Medical School, Singapore  

CONTENT:  
Didactic lectures and manikin-based simulation training used in neonatal resuscitation training are time and resource demanding, yet knowledge and skills acquired deteriorate months post-training. To empower learners to take control of their own learning on a continuous basis, innovative training strategies are needed. Given the proven effectiveness of the use of digital simulation in supporting procedural learning in healthcare education, we designed a single-player web-based, unguided Neonatal Resuscitation Game that supports on-demand learning and describes the evaluation of the effectiveness of the web-based game on the retention of knowledge and skills in resuscitation.  

A non-randomised controlled study included healthcare professionals who attended simulation-based training in neonatal resuscitation from Oct 2016 to Jan 2018 at the SGH and KKH, Singapore. Following the initial training, participants assigned as controls received no additional retraining, while the experimental group received access to the web-based game. Baseline assessment of knowledge and skills in neonatal resuscitation is performed using a multiple-choice question test and a manikin-based skills test done upon completion of training and compared with an assessment at 6-month post-training. Differences between groups were compared using Fisher’s exact test. Knowledge and skill performance scores between study groups were compared using a two-sample t-test or Wilcoxon rank-sum test.  

A consistent decline in knowledge scores of 2.4-5.8 percentage points is seen in all study groups at the final assessment. The decline in knowledge scores was lowest in the intervention group, (p=0.357) while statistically significant declines were seen in the controls (p=0.048), and the experimental non-intervention group (p<0.001). Compared with the other study groups, the decline in total performance and sub-skills tests scores at the final assessment was greater in the intervention group (p=NS). Findings suggest that the use of the web-based game may be protective of knowledge retention but not technical skills in neonatal resuscitation. Modified intention-to-treat analysis showed that use of the web-based game resulted in no difference in mean knowledge test scores, total performance and sub-skills tests scores from baseline to final assessment in the control or experimental groups.  

Findings suggest that the web-based game in its current format, may not be effective in facilitating retention of knowledge and technical skills in neonatal resuscitation. Results cannot be generalised given the limitations of the study design and small study population. Evidence on game quality, accessibility, usability and playability is needed for complete evaluation of game effectiveness.  

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COI: None declared
ID: 42

TITLE: APPROACH TO THE DESIGN AND DEVELOPMENT OF COMPUTER-SIMULATED NEONATAL RESUSCITATION GAME FOR HEALTHCARE TRAINING

AUTHORS: Imelda Ereno, Ho Kah Ying Selina, Vina Tagamolila, Yeo Cheo Lian

AFFILIATIONS: Singapore General Hospital, Outram Road, Singapore

CONTENT:

The Singapore Neonatal Resuscitation Course (SNRC) curriculum is comprised of online e-learning modules, and 1-day instructor facilitated performance and integrated skills training, simulation and debriefing. Current institutional policies require local healthcare professionals to undergo training once every 2 years. However, evidence suggests that knowledge and skills in neonatal resuscitation decay with time as early as 6 months post-training.

SNRC in collaboration with Serious Games Association, Singapore (SGA) designed and developed a computer-simulated neonatal resuscitation assessment game.

Objectives: To develop and implement an unguided-web-based simulation game for re-training and assessment of knowledge and technical skills in neonatal resuscitation.

A single-player, unguided, time-constrained web-based simulation game was built. The player portrays the role of the team leader, with 1-3 non-player characters (NPC) in a scenario-based neonatal resuscitation. To promote situated learning, the 2015 newborn resuscitation algorithm was formalized. Learning content is embodied within the game design by recreating accurate simulation environment, including gameplay features and teaching strategies.

Resuscitation scenarios under 3 main categories (Term, Preterm, Extreme Preterm) with graduated levels of difficulties (Easy, Moderate, Challenging) were developed. At the end of every game session, a detailed feedback is available to the user for self-assessment and monitor user’s progress.

Neonatal resuscitation game is a model of learning that facilitates learning on a continuous basis with a focus on competency rather than compliance to institutional policy. It empower learners to take control of their own education and has the potential to impact re-training and competency maintenance in other resuscitation programmes.

COI: None declared
ID: 161

**TITLE:** DETERMINATION OF HEART RATE IN PRETERM INFANTS AT BIRTH AND THE CORRELATION OF CLINICAL ASSESSMENT WITH SUBSEQUENT PULSE OXIMETRY: AN OBSERVATIONAL STUDY

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**CONTENT:**

Neonatal resuscitation guidelines recommend assessment of heart rate (HR) within one minute of birth. If an infant has a HR <100bpm, apnoea or gasping the algorithm recommends positive pressure ventilation, pulse oximetry (PO), and consideration of an electrocardiogram (ECG). Accuracy of clinical assessment during bradycardia has not been determined outside of animal or mannequin models. We wished to describe how HR is first determined after birth in preterm infants; and when it is first determined clinically, to compare how this correlates with subsequent pulse oximetry (PO) HR.

We performed an observational study of HR assessment in newly-born preterm infants at a university maternity hospital with a tertiary neonatal unit. High-risk deliveries were video recorded for research when a member of the research team was available with ethical approval and parental consent. We recommend clamping the umbilical cord at 60 seconds. We defined the time for clinical assessment of HR as being from when the stethoscope touched the chest until a HR was communicated to caregivers. The time for PO to determine HR was from the start of applying the monitor (Nellcor PO) to when a HR was displayed. HR determined clinically was compared with the subsequent PO HR for clinical relevance; >/<100bpm was chosen as this HR determines how clinicians progress down the algorithm.

We recorded 70 infants [mean (SD) gestational age 29 (3) weeks, birth weight 1290 (430) g]. The median (IQR) time from arrival to the resuscitaire to determine HR was 44 (32, 58) seconds; a continuous HR was obtained at 75 (48, 96) seconds, 20 (0, 48) seconds later. HR was determined more quickly with clinical assessment than with PO [8 (5, 14) vs 40 (29, 75) seconds]. Within 60 seconds of arrival to the resuscitaire, 56 (80%) infants had their HR determined. HR was first determined clinically than with PO for clinical relevance; >/<100bpm was chosen as this HR determines how clinicians progress down the algorithm.

HR was first assessed clinically in most infants. HR that was determined clinically accurately predicted the HR subsequently determined by PO in the majority of infants, including those who were determined to have HR <100bpm.

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Table 1. Distribution of heart rate (HR) by clinical assessment compared with the subsequent pulse oximetry HR (n=46)

**COI:** None declared
ID: 164

**TITLE:** THE PEDI-CAP CAUSES LEAK IN THE VENTILATORY CIRCUIT

**AUTHORS:** Tessa Martherus 1; Annika den Hoed 1; Sophie Cramer 2; Ratna Tan 1; Stuart Hooper 3 4; Arjan te Pas 1

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**CONTENT:**

Intubation of preterm infants is a challenging procedure and therefore the Pedi-CapTM, an exhaled carbon dioxide detector, is often used to verify successful endotracheal intubation. The Pedi-CapTM is also used for evaluating mask ventilation and the change of color indicates adequate lung aeration and pulmonary blood flow. In two cases at the Leiden University Medical Center, we suspected the Pedi-CapTM to have contributed to extensive leak within the ventilatory circuit. Following removal of the Pedi-CapTM, the leak disappeared and the clinical conditions of the infants improved. The aim of this study was to assess the frequency and degree of leakage caused by the Pedi-CapTM.

This study consists of a bench test and retrospective observational study. In bench test I, the Pedi-CapsTM were connected between the NeopuffTM and an artificial test lung. The Pedi-CapTM was placed underwater to detect leakage of air. For bench test II, the disposable Avea VarFlex Flow transducerTM was connected inline the ventilatory circuit to measure leak. Also, recordings of intubations in the delivery room were analyzed retrospectively. The median leak of all Pedi-CapsTM was calculated, as well as leak before and after removing the Pedi-CapTM.

Bench I test (n=44) showed the origin of leak: the (rippled) male end of the Pedi-CapTM. When the Pedi-CapsTM were connected directly to the NeopuffTM 32% of the Pedi-CapsTM caused inevitable extensive leak and 34% caused leak that diminished after sealing the end. In bench test II (n=44) the Avea flow transducer measured median (IQR) leak of 22% (18-60). In the retrospective analysis (n=17), the median (IQR) leak during neonatal stabilization was 39% (8-82). In cases the Pedi-CapTM was removed from the ventilatory circuit, the leak decreased significantly after removal (before vs after; 17% (7-75) vs 4% (2-10), p=0.004) (Figure 1).

The (rippled) male end of the Pedi-CapTM causes leakage varying from 8-82%. Large leaks can unnoticedly compromise respiratory support. We therefore recommend to remove the Pedi-CapTM after successful intubation and to be cautious when using the Pedi-CapTM for evaluation during mask ventilation.

**IMAGES:**
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**COI:** None declared
ID: 172

**TITLE:** MEASURING TEMPERATURE IN PRETERM RESUSCITATION; A FEASIBILITY STUDY

**AUTHORS:** Fameesh Azeez 1; Aneurin Young 2; Preethish Shetty 3; Alok Sharma 4

**AFFILIATIONS:** Dept of Neonatology, Princess Anne Hospital, Southampton, UK

**CONTENT:**

Recommendations regarding preterm resuscitation (NLS,NRP,European Consensus 2019) focus mainly on clinical management of airway and breathing at birth. Standard recommendations with regards to preventing hypothermia and hyperthermia focus on measures to keep a warm environment and use of a source of warmth i.e. infant warmer and plastic bag or thermal mattress. The Neonatal Life Support guidelines recommend measuring temperature only if resuscitation is prolonged. The impact of measuring temperature and introducing changes to the heating source as well as adding or removing thermal warming devices in response to measured temperatures has not been investigated. A prospective study of measuring the temperature of neonates less than 32 weeks after birth and during neonatal resuscitation, till stabilisation on the neonatal unit was performed in tertiary neonatal unit.

A prospective study was performed in 2017 measuring axillary temperature in babies < 32 weeks gestation. 4 temperature points were measured. T0 (temperature at birth), T1 (temperature after the baby was resuscitated in a plastic bag under the warmer with or without a trans-warmer and just prior to transfer into the transport incubator), T2 (temperature on arrival in NICU) and T3 (temperature when placed in a humidified incubator). T0 was measured using a servo control probe on the resuscitaire. T1-T3 were measured using a digital axillary thermometer. In July 2017 the servo controlled temperature was capped at 37C to avoid hyperthermia. Transwarmer use was also limited to babies who were cold at 10 minutes. Temperature on admission for babies under 32 weeks in 2017 was compared with 2016.

63% (64/102) babies had temperature measurement during resuscitation. 52 (24-32 weeks gestation; median 27) had all 4 values measured. T0 temperatures varied from 34.8-35.9C and increased till a steady state was achieved, so an absolute value was difficult to determine when measuring temperature with the servo-controlled probe. Mean temperature values T1 (36.8 Range 35.4-38.5), T2 (37.0 Range 36.5-39) and T3 (37.1 Range 36.6-39) increased over time during resuscitation, stabilisation and transfer. The incidence of hypothermia and hyperthermia decreased after implementation of measurement of temperature during preterm resuscitation (figure 1) from February to December. Comparison of temperature on admission showed that the percentage of babies that were normothermic increased from 72 to 87% from 2016 to 2017. Standardizing servo-controlled temperature to 37C resulted in less hyperthermia.

This is the first study demonstrating that standardised measurement of temperature throughout resuscitation in extremely and moderately preterm neonates is feasible. Measuring temperature during preterm resuscitation has resulted in better thermal outcomes in our setting. It allows monitoring of trends in temperature allowing interventions that can treat both hypo and hyperthermia. The methodology is reproducible and can be used in all settings.

**IMAGES:**

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Figure 1 Measuring Temperature in Preterm Resuscitation

**COI:** None declared
GUIDELINES FOR THE RESPIRATORY MANAGEMENT AT BIRTH OF SPONTANEOUSLY BREATHING BABIES LESS THAN 28 WEEKS GESTATION.

AUTHORS: Ziad El Ghannudi

AFFILIATIONS: 1 MSc Neonatology Student, Faculty of Health Sciences, University of Southampton, Southampton, UK.
2 Pediatric Department, Centralsjukhuset Kristianstad, Kristianstad, Region Skåne, Sweden.

CONTENT:

Extremely premature infants (< 28 weeks of gestation) have a special cardiopulmonary physiology at birth exposing them to a wide range of complications varying from death to short- and long-term morbidities. Alveolar atelectasis, hypoventilation and ventilation-perfusion mismatch are common in this group secondary to the combination of immature airways and surfactant deficiency which prevents preterm lungs from maintaining adequate FRC. This contribute to the development of RDS and subsequent BPD. The first few hours after birth are the critical time for the preterm infant at which some of the major complications (such as death, RDS and IVH) directly occur as well as major physiological changes that contributes to long-term complications (such as BPD and ROP). The first hour after birth is often referred to as the golden hour and interventions in this hour had been a subject for a large spectrum of research studies.

A range of measures has been clinically applied and/or studied for the initial management of extremely premature babies. These can be widely divided into non-pharmacological (Non-invasive respiratory support, sustained lung inflation and supplemental oxygen) and pharmacological (surfactant, caffeine, intratracheal Budosenide, Intratracheal Clara cell secretory protein, Antithrombin, Inositol, Postnatal thyroid hormones, Digoxin and Diuretics)

The aim of this paper is to review the respiratory management of the spontaneously breathing extremely preterm infants at birth exploited from the most recent systematic reviews, meta-analyses, trials and respected expert committees’ opinions and guidelines.

Search strategy and inclusion process:
The research question is developed according to the PIO model and is formulated as: “In extremely preterm infants (P) which respiratory management measures at birth (I) are associated with decreased incidence of mortality and respiratory related morbidities (O).
A structured search process was done in a range of databases including Medline, Embase, Pubmed, NICE, TRIP, Cochrane and Geneva foundation databases. The detailed search strategy and inclusion and exclusion process are shown in Appendices include in the original paper.
Grading of evidence:
The evidence for these recommendations is classified according to the classification scheme adapted from (Shekelle et al., 1999).

This paper was intended to exploit the most recent recommendations about the respiratory management of extremely premature infants and showed the following results:
-CPAP with a PEEP of 5-8 cm H2O is a feasible and effective measure for respiratory support at birth for the prevention of RDS and BPD in spontaneously breathing extremely premature infants, Grade of Recommendation (GoR) A, Level of evidence (LoE) Ia.
-Sustained Lung Inflations of 2-3 seconds duration but not >5 seconds are recommended, GoR D, LoE IV.
-Rescue surfactant administration either by InSurE or LISA/MIST is recommended for the prevention of RDS and subsequent BPD, GoR A, LoE Ia.
-Other measures including HNFC, NAVA, Supplemental oxygen administration and other pharmacological measures are not recommended measures to prevent RDS and subsequent BPD, GoR A-D, LoE Ia-IV.
The author concluded that the most effective measures in the area are: early CPAP with rescue surfactant administration via InSurE or alternatively LISA or MIST. Summary of recommendations is found in the flowchart designed by the author (see Figure).
Further trials are needed for establishing a safer and more effective care of the extremely premature infants.

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Flowchart for respiratory support at birth for spontaneously breathing extremely premature infants

**COI:** None declared
**ID:** 406  
**TITLE:** PLENARY AUDITING OF RECORDINGS OF NEONATAL STABILIZATION - LESSONS LEARNED  
**AUTHORS:** M.C. den Boer1,2; T. Martherus1; M. Houtlosser2; L. Root1; R.S.G.M. Witlox1; A.B. te Pas1  
**AFFILIATIONS:**  
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**CONTENT:**

Recording of neonatal stabilization including video and physiological parameters was implemented at the Neonatal Intensive Care Unit (NICU) of the Leiden University Medical Center. To improve the quality of care, recordings are reviewed during weekly plenary audits since 2014. Audits take place after morning handover (lasting ±20 min) and are chaired by a coordinator not involved in hands-on care. During these audits, provided care is reviewed, discussing mask technique, protocols and decision alternatives. Concluding the audit, all lessons learned are captured. The aim of this study is to provide insight in how plenary audits can contribute to improvements in the quality of care.

This is a longitudinal observational study. We analysed all notes made during audits and minutes sent out after audits by categorizing and counting all lessons learned that were captured.

From February 2018 until February 2019, 40 plenary audits were conducted. 22 (20-25) NICU staff members were present, with consultants being represented the most, and nurses being underrepresented. During these audits, a total of 131 lessons learned were captured. 38% of all lessons were applicable to the medical staff, 4% to the nursing staff, 40% to both medical and nursing staff, 8% to obstetrics, and 9% to others. Most lessons learned were connected to equipment (16%; e.g. correct order of starting up devices), trial protocols (14%; e.g. correct order of trial procedures), decision alternatives (14%; e.g. how to act in case of an obstructive respiratory pattern), and physiology of neonatal transition (9%; e.g. larynx function). As a direct consequence of these audits, NICU staff members three times agreed that the local protocol for neonatal stabilization should be adapted.

During plenary audits conducted at our NICU, many lessons learned could be captured, especially lessons connected to equipment and trial protocols. Frequent audits of neonatal stabilization allow staff members to recognize and address deficits in knowledge or skills, thus improving the quality of care they provide. Furthermore, alternative approaches can be plenary discussed, allowing the protocol for neonatal stabilization to be improved.

**COI:** None declared.
ID: 440

TITLE: IS GOLDEN HOUR POSSIBLE IN LOW INCOME COUNTRIES? THE GOLDEN HOUR NEST (NEONATAL ESSENTIAL SURVIVAL TECHNOLOGY) PROJECT FOR IMPROVING PREMATURE BABIES’ PROGNOSIS IN HOSCO (HÔPITAL SAINT CAMILLE OF OUAGADOUGOU- BURKINA FASO)

AUTHORS: Paolo Ernesto Villani 1, Maria Pierro 1, Giuseppe De Bernardo 1, Zagre Nicaise 2, Christine Dyemkouma 2, Benedetta Allais 1, Federica Beccagutti 1, Paola Castelli 4, Chiara Monfredini 1, Cecilia Plicco 3, Sonia Rico 1, Sordin Desirée 1, Lucia Tubaldi 3, Maria Paola Chiesi 3, Elena Ciarmoli 1, Paul Ouedraogou 2.

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CONTENT:

The first hour of life (FHL) is a critical time for all infants requiring any support for their transition to the extra-uterine life. The golden hour (GH) concept refers to a standardized, timely, and efficient approach, initiated within the FHL, leading to a lower risk of mortality and morbidities. Most of these interventions are standard of care in developed countries (DC) but in low-income countries (LIC), where neonatal mortality is accounted for up to 99% of the global neonatal mortality, no standardized approach has yet been established. To improve the knowledge of the GH approach of the personnel involved in perinatal care is needed.

A specific theoretical and practical GH training in two days (for a total of 9 hours) was granted to the personnel working in the delivery room and all the health care providers of the neonatal unit at the HOSCO and to the obstetric personnel of the the spoke centers. The project includes at least two trainings per year. Temperature stabilization (called “Warm”), basic respiratory support in the delivery room (called “Pink”) as the Helping Babies Breathe program, hygiene measures for prevention of neonatal infections (called “Protected”), prevention of hypoglycaemia with early breast feeding (called “Sweet”) are chapters of our NEST program to standardize and increase knowledge in HOSCO. Pre and post-test were carried out to evaluate the trainee learning and the efficacy of the training.

50 health care providers of HOSCO and its referral centres (doctors, murses, midwifes, healthcare operators) participated to the training. Pre and post-test including 25 questions (5 on neonatal resuscitation, 5 on temperature stability, 5 on hygiene, 5 on kangaroo mother care, 5 on feeding practice) were submitted. 38% of correct answers in the pre test and 63.1% in post-test were scored, with an improvement of almost 50% at the end of our NEST course.

Our results suggest that the training is effective in improving the knowledge of health personnel about the FHL. A global standardized approach for improvement the immediate survival and the morbidities in LIC is needed. In HOSCO the application of our protocol could improve neonatal care but an important cultural changes were required. Further studies in order to confirm our results and propose the GH approach in LIC are required.

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COI: None declared
ID: 460

TITLE: PRETERM INFANT BREATHING IN THE DELIVERY ROOM: WHAT TRIGGERS?

AUTHORS: Silva, A.C.B.; Paiva, V.M.D; Gonçalves, A.B. ; Martins-Celini, F.P. ; Aragon, D.C.; Calixto,C. ; Silva, A.C; Ferreira, CHF; Maiolini, B.L.; Toffolo, R.O.; Martins-Filho, P.F.; Souza, T.R.; Souza, G.A.; Couto, L.D.C.A.; Fukamichi, S.L.; Gonçalves-Ferri, W.A

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

CONTENT:

Carotid corpuscles are important O2 sensors, being important for breathing in humans. Studies show that they are also able to detect reductions in pH, increase in blood glucose and in lactate plasma concentration. Recent studies suggest that pH, glucose and lactate are fundamental to stimulate inspiratory and expiratory responses at the birth. A challenging metabolic situation, such as pH ≤ 7.22; glycemia > 85 mg/dL and lactate ≥ 5 mmol/L stimulate the carotid sinus in mammals. Thus, we analysed the influences of these factors in the breathing patterns at birth in preterm infants and also the association with ventilatory assistance in the delivery room.

Cohort study. Very-low birth weight infants born at tertiary hospital were included (2016 - 2018). Newborns with malformations, deaths, or requiring cardiac massage were excluded. The patients were divided in three groups:

- Group 1. Orotracheal intubation in the delivery room, due to respiratory distress or apnea.
- Group 2. CPAP in delivery room, but CPAP failed during the first 72 hours of life.
- Group 3. CPAP in delivery room and patients that didn’t require assistance ventilatory.

The association between pH ≤ 7.22; glycemia > 85 mg/dL and lactate ≥ 5 mmol/L in the first hour of life and respiratory outcomes was analysed. The relative risks and their 95% confidence intervals were calculated by adjusting a log-multinomial regression model. The software used was SAS 9.4.

During the period 398 patients were born, 78 were excluded due to the exclusions criteria, 320 patients were elected for analysis. The number of patients in the Group 1, 2 and 3 was respectively, 116 (36.2%), 85 (26.6%), 119 (37.2%); with weight average 824, 999 and 1187 grams and gestational age medium 26, 27 and 30 weeks, respectively.

Among the patients who presented challenging metabolic situation 47.1% did not require ventilatory support, and 22% required orotracheal intubation [RR(CI95%) to intubated= 0.51(0.33; 0.73) and RR(CI95%) to spontaneous breathing= 1.53(1.16; 2.03)].

Lactate ≥ 5 mmol/L and pH ≤ 7.22 were associated with successful ventilation, while, glucose > 85 mg/dL alone is not associated, with relative risk, respectively 1.97 (CI95%1.17; 3.33); 1.70 (CI95%1.20; 2.41); 1.36 (CI95%0.90; 2.06). There was no association between metabolic status and CPAP failure. (Table 1)

Adequate breathing in the delivery room is associated with more than those presented in the literature, such as gestational age and birth weight. A challenging metabolic situation is associated to respiratory activation in VLBW infants at the birth, as demonstrated in our results. Clinical study should be performed to provide adequate metabolic status in preterm infants at birth to favour the spontaneous breathing in delivery room.

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COI: None declared
ID: 513
TITLE: WOULD GROWTH RESTRICTED INFANTS BE A SUITABLE POPULATION FOR LESS INVASIVE SURFACTANT ADMINISTRATION (LISA)?
AUTHORS: Benjamin Holter 1
Sadaf Bhayat 1
Christina Kortsalioudaki 1
Giles Kendall 1
AFFILIATIONS: 1 Neonatal Unit, University College Hospital London, London, United Kingdom

CONTENT:

LISA has been shown to improve the combined outcome of death/BPD in all infants born at less than 32 weeks gestation. Babies receiving surfactant who require ventilation beyond 24 hours are unlikely to benefit from the LISA approach. In preterm infants with intra-uterine growth restriction surfactant production may be altered, indicating that they may derive additional benefit from exogenous surfactant. To date the role of LISA in the subgroup of preterm babies with growth restriction has not been demonstrated. The aim of this study is to determine if preterm infants with IUGR require longer initial ventilation (>24 hours) suggesting that LISA may be unsuitable.

We performed a retrospective, case-control study. Records of inborn preterm infants (23+0 and 31+6) admitted to UCLH between 2017 and 2018 were reviewed. Birth-weight <10th centile was classified as IUGR. Demographics, location of intubation, and time to extubation were recorded for both IUGR and non-IUGR neonates. Results were analysed by unpaired t-test and two-tailed Fisher’s exact test as appropriate.

Between 2017 and 2018 there were 149 admissions meeting criteria, 34 (22.8%) were IUGR. There was no significant difference between IUGR and the need for intubation on labour-ward (LW) (79% IUGR vs 85% p=0.425). Amongst intubated infants, 50% were extubated within 24 hours of life regardless of their growth status (14 (50%) of intubated IUGR infants vs 51 (50%) of non-IUGR (p=1)). Babies with IUGR were born at a significantly later average gestation than normally grown infants (30 vs 26 weeks p<0.05). No other recorded factors were found to be significantly related to the presence of IUGR (table 1).

We found no significant difference in the need for intubation on LW or rate of extubation within 24 hours between IUGR and non-IUGR preterm infant. Our data suggests that LISA is a suitable approach in preterm infants with IUGR. Given the association between IUGR and BPD, LISA in this population could be of benefit and its use warrants further investigation.

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Table 1. characteristics of growth restricted infants vs normally grown infants.

COI: None declared
ID: 609
TITLE: SHORT-TERM OUTCOME OF NEONATES BASED ON THE NEONATAL RESUSCITATION AND ADAPTATION SCORE
AUTHORS: Andreea Avasiloaiei 1,2, Mihaela Moscalu 1, Anca Bivoleanu 2, Gabriela Zonda 1,2, Mădălina Grădinaru-Popa 2, Maria Stamatin 2
AFFILIATIONS: 1 - Grigore T. Popa University of Medicine and Pharmacy, Iasi, Romania
2 - Cuza-Voda Clinical Hospital of Obstetrics and Gynecology, Iasi, Romania

CONTENT:

The Neonatal Resuscitation and Adaptation Score (NRAS) has been recently proposed as a more reliable alternative for the initial evaluation of neonates, compared to the Apgar score. The aim of our study was to compare the predictibility of the two scores concerning the need for admission to the Neonatal Intensive Care Unit (NICU).

We performed a prospective study on 368 randomly chosen infants, born in the Cuza-Voda Clinical Hospital of Obstetrics and Gynecology over three months (21 January-20 April 2019). We assessed the following parameters: mode of birth, gestational age, birth weight, Apgar scores and NRAS at 1 and 5 minutes, and short-term outcome, measured as admission to the NICU, the high-dependency unit or the rooming-in unit.

The infants were delivered through Cesarean section in 69.84%, had a mean birth weight of 3220 grams (500-5380 g) and a mean gestational age of 38 weeks (23-42 w). The Apgar score had median values of 9 at 1 and 5 minutes and the NRAS had median values of 10 at and 5 minutes. 8.97% were admitted to the NICU, 8.15% to the high-dependency unit and 82.88% to the rooming-in unit. Neither the Apgar score and the NRAS was found to be correlated with the mode of birth. While the Apgar score at 5 minutes correlates best with gestational age (r=0.4843, P<0.01), the NRAS at 5 minutes was the best predictor for admission to the NICU (AUC=0.87), compared to the NRAS at 1 minute (AUC=0.862), the Apgar score at 1 minute (AUC=0.846) and at 5 minutes (AUC=0.858).

The Neonatal Resuscitation and Adaptation Score seems a better predictor for admission to the Neonatal Intensive Care Unit, compared to the Apgar score, but in terms of gestational age and mode of birth, the difference between the two scores is not significant.

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TITLE: ADVERSE EVENTS DURING NON-EMERGENCY NEONATAL INTUBATIONS; A DIAGNOSTIC AUDIT TO UNDERSTAND OPPORTUNITIES FOR IMPROVEMENT

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CONTENT:

Endotracheal intubation is one of common procedures performed in a neonatal intensive care environment. Observational studies have shown intubation-related adverse events (IAE) in up to 40% of intubations. This is due to substantial variation in subscription to evidence-based practices relevant to intubation. Cognitive aids such as checklists optimise clinician performance but are not always used in this setting. The aim of our phase one quality improvement initiative was to audit the occurrence of IAEs during neonatal intubation and understand contributory factors. We then intended to use that information to guide implementation of specific improvement measures to reduce IAEs.

A retrospective audit of all non-emergency intubations in our neonatal unit over a 1-year period (2018) was performed. Emergency neonatal intubations in delivery room, operating theatres and emergency department were excluded as documentation standards were variable. Data-set included patient demographics, indication/preparation for procedure, premedication use, grade of practitioner performing intubation, time taken from decision to successful intubation and occurrence of any one of IAEs. IAEs were defined as; desaturations <70% and/or bradycardia 30 seconds, tube malposition requiring removal and reintubation, procedure time > 30 minutes. Data was entered and analysed in an Excel spreadsheet.

A total of 62 neonatal intubations were performed during study period of which 36(58%) classed as non-emergent. 32 case notes were available for analysis. 21(66%) were preterm and 11(34%) term. Respiratory distress syndrome of prematurity was the predominant indication (18, 56%) and most intubations occurred 2 attempts. Median time from decision to intubation was 42 minutes. Desaturations <70% and/or bradycardia 30 seconds was noted in 14/32(44%) of cases Any one of IAEs was present in 21/32(66%) cases. There was evidence of profound variation in documentation standards and suboptimal communication between team members during the procedure.

Our data showed an unacceptably high rate of IAEs during non-emergency neonatal intubation. Lack of standard checklist, poor preparation and ineffective team communication were contributory. After consultation with multidisciplinary team we have implemented targeted simulation training and also developed an intubation timeout checklist (Figure 1) to reduce variability in practice. The impact of this intervention will be studied over next year.

IMAGES: https://www.eiseverywhere.com/eselectv3/v3/events/351149/submission/files/download?fileID=0548a546e223330bcb69e3ba3c591ede-MjAxOS0wNSM1Y2UyNjY2ZWYw

Figure 1: Intubation Timeout Checklist

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