ID: 44

TITLE: EFFECTS OF NASOJEJUNAL TUBE (NJT) FEEDING WHEN COMPARED TO NASOGASTRIC TUBE (NGT) FEEDING ON GROWTH AND ADVERSE CONSEQUENCES (ASPIRATION PNEUMONIA, SEPSIS, NECROTISING ENTEROCOLITIS AND DEATH) IN PREMATURELY BORN INFANTS LESS THAN 34 WEEKS GESTATION.

AUTHORS: Alice Scott 1; Jodie Nguyen 2; Ramon Fernandez 1,2; Cathy Garland 2; Phil Amess 2; Rob Bomont 2; Heike Rabe 1,2; and Prashanth Bhat 1,2

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2 Trevor Mann Baby Unit, Brighton and Sussex University Hospitals NHS Trust, Brighton, UK

CONTENT:

Gastro-oesophageal reflux (GOR) is common in premature infants. Whilst this usually resolves with time physiologically or with minimal use of anti-reflux medications, some infants will continue to experience symptoms such as frequent vomiting and failure to thrive in the neonatal period. The greatest risk of continued GOR is aspiration pneumonia. It is therefore necessary, in some cases, to feed by nasojejunal tube (NJT). Whilst evidence exists to suggest that NJT feeding improves outcomes for those with severe GOR, there is concern over the risks associated with NJT feeding. Most notably, there is a potential correlation between NJT feeding and the development of necrotising enterocolitis (NEC). The aim of the study was to determine the effects of NJT feeding compared to nasogastric tube (NGT) feeding, and to identify the risk profile of those who develop NEC, including any co-existent factors.

A retrospective matched pair-cohort analysis of patient data over a five-year period was undertaken. Prematurely born infants less than 34 weeks’ gestation admitted to a tertiary neonatal unit who needed nasojejunal feeding were identified and matched for gestational age with an equal number of infants who received nasogastric feeds only. In addition, data from premature infants less than 34 weeks who developed NEC during the same time period were also collected. Infants with major congenital abnormalities and infants who developed NEC before NJ tube was inserted were excluded from the study. SPSS Statistics version 25 was used to analyse the data. Mann Whitney U test was used to compare the outcomes between the two groups. A p-value < 0.05 was considered statistically significant.

Twenty NJT fed infants less than 34 weeks gestation were matched for gestational age with twenty infants who received NGT feeds. There were no significant differences between the two groups with regards to the baseline characteristics. None of the infants developed an intestinal perforation secondary to NJT placement. There were no differences between the two groups with regards to rate of growth (p=0.409), aspiration pneumonia (p=0.79), NEC (p=0.602), sepsis (p=0.221), time to discharge (p=0.429) or death (p=0.429). In addition, 29 infants less than 34 weeks’ gestation who developed NEC during the same time period were identified. 2 out of these 29 infants had been fed via NJT and the remainder via NGT. 21 out of 29 infants required surgery for their NEC, 2 of which died subsequently. No common factors which could be considered potentially causative of NEC were found within the group.

Our results suggest that NJT feeding is possibly a safe method to deliver enteral nutrition to premature infants < 34 weeks with severe GOR who respond poorly to more conservative treatments. Equal growth rates between the groups indicate that NJt fed infants may not suffer from notable malabsorption or failure to thrive. Further large randomised controlled studies would be needed to corroborate these findings and confirm the safety of NJT feeding.

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Results
COI: None declared
**ID:** 286  
**TITLE:** EXOMPHALOS: 9 YEAR EXPERIENCE OF A TERTIARY NEONATAL INTENSIVE CARE UNIT  
**AUTHORS:** Sarah Williamson 1; Louise Lawrence 2; Shree Vishna Rasiah 3.  
**AFFILIATIONS:** Neonatal Intensive Care Unit, Birmingham Women's & Children's NHS Foundation Trust, Birmingham, United Kingdom.  

**CONTENT:**

Exomphalos is a frequently seen congenital abnormality, with reported prevalence in the UK of 3.8 per 10,000 births.1 Exomphalos is an isolated finding in 1.4 per 10,000 cases, whereas 1.2 per 10,000 are associated with multiple abnormalities, and a further 1.2 per 10,000 having chromosomal anomalies2. Associated abnormalities have been shown to influence long term survival, 1 year survival in isolated anomalies reported as 91%, compared with 81% in multiple abnormalities, and 27% if associated chromosomal anomalies.

Our aim was to describe our experience key outcomes for infant and families with exomphalos admitted to a single surgical neonatal intensive care unit in the West Midlands.

Retrospective case note review of all infants diagnosed with exomphalos and admitted to a single surgical neonatal intensive care unit (NICU) over a 9 year period. Infants were identified and data collected from Badgernet electronic patient record and paper notes between 1st April 2009 and 31st March 2018.

29 infants were identified, 55% male (n=16). Mean gestation 36 weeks (28-40), mean birth weight 2965g (1130-4730g), 59% (n=17) were classified as exomphalos major. 26% (n=8) required intubation at delivery, and 17% (n=5) required inotropic support. 83% (n=24) underwent an echo to look for associated cardiac anomalies. 59% (n=17) had structural anomalies, 4 of these were felt to be significant. 34% (n=10) had other congenital abnormalities, most commonly musculoskeletal (n=5), gastrointestinal (n=4), and ENT (n=3). 34% (n=10) had an underlying genetic diagnosis, mostly commonly being Beckwith-Weideman (n=8).

Overall mortality was 21% (n=6), all infants having exomphalos major. 2 infants had an underlying genetic diagnosis, and 3 significant underlying congenital anomalies. 5 infants were born preterm (28 - 36 weeks). Time of death ranged from day of birth to 2 years of age.

Our experience suggests that infants with diagnosis of exomphalos major and associated congenital or genetic anomalies are at increased risk of mortality, especially if born premature or require ventilatory and / or inotropic support in the postnatal period.

This review enables us to give parents more detailed information during antenatal counselling in our neonatal unit.

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Table 1: Associated Anomalies

**COI:** Non declared
ID: 351
TITLE: CLINICAL OUTCOMES OF CHILDREN WEANED FROM PARENTERAL NUTRITION AFTER NEONATAL GASTROINTESTINAL SURGERY.
AUTHORS: Paola Roggero 1, 2, Nadia Liotto 1, Pasqua Piemontese 1, Michela Perrone 1, Giorgio Fava 3, Francesca Taroni 4, Maria Angela Pavesi 5, Maria Lorella Gianni 1, 2, Fabio Mosca 1, 2
AFFILIATIONS: 1 Neonatal nutrition centre. NICU Fondazione IRCCS Ca’ Granda Ospedale Maggiore Policlinico 2 University of Milan. Department of Clinical Sciences and Community Health 3 Department of Pediatric Surgery, Fondazione IRCCS Ca’ Granda - Ospedale Maggiore Policlinico, Milan, Italy. 4 Pediatric Nephrology, Dialysis and Transplant Unit, Fondazione IRCCS Ca’ Granda - Ospedale Maggiore Policlinico, Milan, Italy. 5 Radiology Unit, Pediatric Division, Fondazione IRCCS Ca’ Granda - Ospedale Maggiore Policlinico, Milan, Italy.
CONTENT:
The majority of children with intestinal failure (IF) due to short bowel syndrome (SBS) [dependence on parenteral nutrition (PN) for at least 90 days] are nowadays capable to be weaned from PN. Scarce evidences are available regarding the follow-up setting after intestinal adaptation. The aim of the study was to investigate the occurrence of morbidities after intestinal adaptation in children who underwent neonatal gastrointestinal (GI) surgery.

In our Home PN Centre we develop a multidisciplinary and long term follow-up to obtain a primary and secondary prevention of the unsuspected and life threatening complications after intestinal resection. Specifically, patients after intestinal adaptation enter in a follow-up program that includes dedicated staff in gastroenterology, nutrition, paediatrics, surgery, nephrology and radiology. Each patient underwent to a serial exams/clinical evaluations including stools assessment for steatorrhea and haematochezia, endoscopy, nutritional intake, urinary analysis, ultrasound and X-ray follow through of GI tract and Breath H2 test.

We included 47 children (27 males) with IF after neonatal GI surgery. The mean GA at birth was 32.8±5.1 wks; age at the last visit was: 7.8±5.8 yrs (0.6-24 yrs). Causes of SBS were: NEC (9/33), multiple bowel perforations (6/33), volvulus (5/33), intestinal aganglionosis (4/33), gastroschisis (2/33), intestinal atresia (7/33). Duration of PN of was 1.1±1.8 yrs (3 months-9 yrs). Length of small bowel residual was 51±39 cm (14-160 cm), 13/33 children had totally preserved colon, whereas 16/33 had a partial residual colon. Among 33 infants weaned from PN, 42.4% developed morbidities during the follow-up (3/33: anastomotic ulcers with clinical anemia, 3/33: gallstones, 3/33: kidney stones, 2/33: symptomatic D-lactic acidosis, 1/33: acute pancreatitis and cholecystitis and 2/33: venous trombosis. The occurrence of morbidities was found after 4.5±3.3 yrs (range 0.1-10.7 yrs) the weaning from PN.

This study suggests that the occurrence of morbidities after PN weaning is not a rare event. Therefore a multidisciplinary and long term follow-up is mandatory.

COI: None declared
ID: 453

TITLE: EXCLUSIVE HUMAN MILK DIET IMPROVES OUTCOMES WHILE MAINTAINING GROWTH

AUTHORS: Jenelle Ferry MD 1
Marcia Kanyo Schulz, MS, RNC-OB 2
Janessa Canals-Alonso, MHS, MSN, RNC-NICU 3

AFFILIATIONS: 1 Tampa Regional Practices, Mednax, Inc, St. Joseph's Women's Hospital, BayCare Health System, Tampa, Florida
2 St. Joseph's Women's Hospital, BayCare Health System, Tampa, Florida
3 St. Joseph's Women's Hospital, BayCare Health System, Tampa, Florida

CONTENT:

A human milk diet is the gold standard for infants. Fortifiers are added for optimal nutrition, energy and protein requirements for appropriate growth of preterm infants. An exclusive human milk diet (EHMD) consists of mother’s own milk (MOM) or donor human milk (DHM) with human milk based fortifier (H2MF) and human based cream (Cr). An EHMD is better tolerated than a partial human milk diet with cow milk based fortifier (CMBF) for extremely low birthweight (ELBW) infants. An EHMD is shown to decrease the incidence of necrotizing enterocolitis (NEC) and sepsis, while improving feeding tolerance and earlier attainment of full feeds. Some centers that have adapted an EHMD have struggled with growth.

In a prospective chart review ELBW (≤1000 g) infants admitted to St. Joseph’s Women’s Hospital’s NICU from October 2013 to November 2015 were fed either a partial human milk diet or EHMD. For the first 7 months of study period, infants received a partial human milk diet with MOM or DHM fortified with CMBF. For a 5 month period infants received a partial EHMD, with some feeds including H2MF and hydrolyzed protein concentrated liquid CMBF. For the final 12 months infants received an EHMD with H2MF and Cr. Data collected included days of MOM, total parenteral nutrition (TPN), and central lines, number of feeds held, growth parameters, and NEC. Clinical characteristics and outcomes were compared for those receiving a partial human milk diet and an EHMD.

A total of 91 ELBW infants met criteria for inclusion. Demographic and clinical characteristics of the populations were similar; infants were of similar gestational age and birth weight. The mean birth weight in the overall population was 778 g. Those infants receiving an EHMD had a statistically significant increase in number of days on MOM, decreased number of days with feeds held, and decrease in both medical and surgical NEC. Infants who did not receive an EHMD had significantly higher odds of developing any NEC (p<0.0001). There was no statistical difference in the growth, as measured by weight gain, head circumference, and length. While the number of days with a central line and days on TPN did not reach statistical significance, there was a decrease of 6-7 days in the EHMD group, which may be clinically significant.

ELBW infants who received EHMD with early fortification had similar growth to those fed CMBF. There was a clinical decrease in line and TPN days that was not statistically significant. There was no change in length of time to full feeds. EHMD fed infants showed a significant decrease in NEC and surgical NEC. This supports the use of EHMD to improve clinical outcomes while maintaining adequate growth in ELBW infants.

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Table 1. Outcomes of Exclusive Human Milk Diet Compared to Partial Human Milk Diets

COI: I have received honoraria from Prolacta Bioscience, after the period of this data collection
ID: 477

TITLE: UNFAVORABLE EVOLUTION OF ENTEROCOLITIS: THE MYSTERY CONTINUES...


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

CONTENT:

Necrotizing enterocolitis (NEC) is a serious multifactorial disease that affects premature newborns, presenting high morbidity and mortality, oftentimes requiring surgical treatment that may result in short bowel syndrome. This study aims to identify factors that could indicate the severe evolution of the NEC and the needing for surgical intervention.

This retrospective cohort study is based on medical records of all patients weighing less than 1500 grams diagnosed with NEC from 2010 to 2018 at HCFMRP - USP - Brazil. NEC diagnosis was based on radiological findings (grade IIB or III Bell’s stage). Patients with malformations were excluded. The patients were divided into 2 groups: whether they need or not laparotomy. Clinical and laboratory data were collected from patients. For statistical analysis of the categorical variables, Fisher's Exact analysis was used and the Wilcoxon Test was used for the continuous variables.

Between 2010 and 2018, 1196 children under 1500 grams were hospitalized, of whom 65 were diagnosed with enterocolitis. Of these, 28 need laparotomy and 37 received only clinical treatment. The following data were collected from patients 72 hours prior to NEC onset: vasoactive drug use, lower mean blood pressure, worst laboratory values (pH, lactate, hemoglobin), thrombocytopenia, tachycardia, and the need of blood transfusion. The gestational age, antenatal corticosteroid treatment, length and type of enteral diet, caffeine treatment, length of umbilical catheter use were assessed as well. There was no significant difference between the groups that had the most favorable outcome (clinical treatment) and the group that needs surgery (Table 1).

In the present study, we could not find any association between severe outcome (need of surgical treatment) and clinical or laboratory factors. Further studies are needed to evaluate possible predictive factors of unfavorable evolution of enterocolitis.

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COI: None declared
ID: 484

**TITLE:** CAN HEMODYNAMIC INSTABILITY DURING NEC EVOLUTION INTERFERE WITH OUTCOMES?

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

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

**CONTENT:**

The role of intestinal perfusion in the pathogenesis and evolution of Necrotizing Enterocolitis (NEC) is not well established. The treatment with hypothermia in the NEC has been proposed based on the hypothesis of its protective action of intestinal perfusion avoiding ischemia and/or necrosis. However, there are no studies showing the association between possible changes in intestinal perfusion during the NEC and the course of the disease. The aim of this study is to evaluate whether the presence of hemodynamic shock signs after the diagnosis of NEC is associated with the type of outcome of the disease.

This is a retrospective cohort study of patients diagnosed with NEC from 2010 to 2018 at a tertiary hospital. Patients weighing less than 1500 grams with a diagnosis of NEC, based on radiological findings (grade IIB or III Bell's stage), were selected. Patients with malformations were excluded. The patients were divided into two groups: those who underwent laparotomy and the other who required only clinical treatment, and then compared the presence of hemodynamic instability (heart rate greater than 160 bpm maintained during disease progression and/or mean arterial pressure less than gestational age) during NEC evolution, after diagnosis.

Among 1,196 newborns hospitalized between 2010 to 2018, 68 had NEC diagnosis, but 3 presented malformations and were excluded. Then, 65 (5.4%) patients with NEC were selected and of these, 28 (43%) patients required surgical intervention. Among the patients with enterocolitis, 39 (60%) had signs of hemodynamic instability, 28.2% of patients with hemodynamic instability required surgery. 65% of neonates who remained stable hemodynamically required surgery (figure 1). The relative risk for hemodynamic instability and surgical necessity was 0.42 (95% CI 0.19-0.94).

This study showed that hemodynamic changes after the diagnosis of NEC may be associated with more favorable evolution of the disease. More studies are needed to evaluate the influence of hemodynamic status and the role of intestinal perfusion in the evolution of NEC.

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**COI:** None declared
ID: 605

TITLE: ABNORMAL GUT TRANSIT ASSESSED BY X-RAY CONTRAST IMAGING IN NECROTIZING ENTEROCOLITIS

AUTHORS: Jing Sun1; Wenchao Chen2; Susanne S. Kappel1,3,; Per T. Sangild1,3,; Lise Aunsholt1,3

AFFILIATIONS: 1 Comparative Pediatrics and Nutrition, Department of Veterinary and Animal Sciences, University of Copenhagen, Denmark; 2 Department of Neonatology, The First Affiliated Hospital of Jinan University, Guangzhou, Guangdong, China; 3 Department of Neonatology, Rigshospitalet, Denmark.

CONTENT:

Immature gut motility may be a risk factor for necrotizing enterocolitis (NEC) in preterm infants. However, it is not known whether gut dysmotility is the cause or the consequence of NEC progression and how motility may be disturbed in various gut regions. Food transit pattern in preterm infants beyond the stomach and duodenum is rarely studied. Using preterm pigs as a model for infants, we hypothesized that disturbed intestinal motility precedes NEC progression.

Seventy-three preterm pigs were fed increasing amounts of enteral milk diets for 5 d to induce signs of NEC. On day 4, serial abdominal x-ray imaging was performed to evaluate NEC symptoms and food transit time after oral provision of a contrast solution. Radiological signs of NEC (ileus, pneumatosis, pneumoperitoneum, intestinal collapse), the stomach and small intestinal emptying time (StEmpty, SiEmpty), times for the contrast solution reaching the cecum (ToCecum) and passing from cecum to rectum (CecumToRectum), were recorded. On d 5, gastric residual volume was recorded following euthanasia and severity of NEC lesions in intestine and colon was scored (1-2, healthy; 3-6 increasing severity to necrosis).

There was no radiological signs of NEC during X-ray examination. Piglets with NEC lesions in the small intestine (siNEC), with or without colon lesions, showed delayed StEmpty, ToCecum and CecumToRectum time (all p<0.05) relative to piglets without NEC (noNEC) or having NEC only in colon (coNEC). coNEC did not affect StEmpty, ToCecum and CecumToRectum times but prolonged the SiEmpty time (p<0.05). A tendency to delayed StEmpty, SiEmpty, and first passage of meconium were found in pigs with NEC compared to noNEC pigs (p=0.06, p=0.02, p=0.1, respectively). Regardless of NEC, StEmpty time was correlated to ToCecum time (r=0.66). Increased gastric residual volume was observed in both siNEC and coNEC pigs (p<0.05) and values were correlated to NEC severity score (p<0.001).

Early progression of NEC lesions, especially in the small intestine, is associated with a delay in food transit time across most gut regions in preterm pigs. Prolonged food transit time may be an early predictor of NEC onset in preterm infants.

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Representative images of abdominal x-ray indicating contrast retained in the stomach (left), reaching to the cecum (middle), and contrast in the colon and rectum (right, a). Time for contrast solution reaching to the cecum (ToCecum, b) and emptied from small intestine (SiEmpty, c).

COI: None declared
ID: 648

TITLE: NECROTIZING ENTEROCOLITIS: EVALUATION OF THE ROLE OF HUMAN BONE MARROW-DERIVED MESENCHYMAL STROMAL CELLS (hBM-MSCS) IN A NOVEL NEONATAL MOUSE MODEL OF NEC

AUTHORS: Livia Provitera 1; Genny Raffaeli 1; Ilaria Amodeo 1; Silvia Gulden 1; Gabriele Zuanetti 1; Valeria Cortesi 1; Stefania Crippa 3; Cristina Arribas 5; Marco Maggioni 6; Graziella Alfonsi 7; Stefano Gatti 8; Felipe Garrido 5; Maria Ester Bernardo 3-4; Fabio Mosca 1-2; Giacomo Cavallaro 1.

AFFILIATIONS: 1. IRCCS Fondazione Ca’ Granda Ospedale Maggiore Policlinico, Neonatal Intensive Care Unit, Milan, Italy.
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4. Pediatric Immunohematology and Bone Marrow Transplantation Unit, IRCCS San Raffaele Scientific Institute, Milan, Italy.
5. Newborn Intensive Care Unit, Department of Pediatrics Clinica Universidad de Navarra, Madrid, Spain.
6. IRCCS Fondazione Ca’ Granda Ospedale Maggiore Policlinico, Department of Pathology, Milan, Italy.
7. “Lino Rossi” Research Center for the study and prevention of unexpected perinatal death and SIDS; Department of Biomedical, Surgical and Dental Sciences, University of Milan, Italy.
8. IRCCS Fondazione Ca’Granda Ospedale Maggiore Policlinico, Center for Preclinical Research, Milan, Italy.

CONTENT:

Necrotizing enterocolitis (NEC) is among the leading causes of morbidity and mortality in preterm infants: it affects 10% of very low birth weight infants (VLBW) and carries a 40% mortality rate. Survivors are faced with lifelong complications, including adverse neurodevelopmental outcomes. NEC is defined as a devastating inflammatory process resulting in gut necrosis, whose multifactorial pathogenesis is still unveiled. Despite decades of research efforts, this disease still remains a challenge to treat.

The aim of this study is to investigate the effect of hBM-MSCs on NEC using a neonatal mouse model of necrotizing enterocolitis, due to their very well described anti-inflammatory properties.

NEC was induced in 3-day old C57BL/6 mouse pups through maternal separation, gavage feeding of infant formula, hypoxia followed by cold stress and oral lipopolysaccharide (LPS). Mice were allocated into 4 groups. The control group remained with their mother and breastfed ad libitum. Experimental groups, subjected to experimental NEC, were randomized to receive either no treatment (NEC group) or an intraperitoneal (IP) injection of PBS (NEC + PBS group) or hBM-MSCs (NEC + hBM-MSCs). After 72 hours from NEC induction (PND6) or earlier in case of premature death, mice were sacrificed. Incidence of NEC was evaluated microscopically. A score of 2 or higher indicated presence of NEC, with 3 or higher indicating severe NEC.

Animals exposed to NEC that were either untreated or received PBS alone had a NEC incidence of 80% and 81% (p=0.0002 and p<0.0001 respectively, compared to breastfed pups). Pups exposed to NEC + hBM-MSCs showed a NEC incidence of 63.6% (p=0.0078 compared to breastfed pups). Despite there were no significant differences in the NEC incidence between the 3 groups exposed to NEC, hBM-MSCs seemed to reduce NEC severity (NEC + hBM-MSCs treated pups had a Grade 3 incidence of 30.3%, while NEC alone or NEC + PBS pups had a Grade 3 incidence of 45% or 40.5%, respectively).

Our neonatal mouse NEC model was adequate to induce the disease. hBM-MSCs reduced the incidence and the severity of NEC in our model. Further experiments are needed to better characterize the molecular basis of the mechanism of action of hBM-MSCs on NEC.
Figure 1. Effect of hBM-MSCs on the incidence and severity of NEC. Incidence and severity of NEC (Grades 2, 3 or 4 injury). The number of animals used to derive the data shown in the picture are as follows: Breastfed (n=14), NEC (n=20), NEC + PBS (n=37), NEC + hBM-MSCs (n=33). PBS, phosphate-buffered saline; hBM-MSCs, human bone marrow-derived mesenchymal stromal cells. (***, p=0.0002; ****, p<0.0001; **, p=0.0078).

COI: None declared
ID: 678

**TITLE:** UMBILICAL ARTERIAL CATHETER AND ENTERAL FEEDING IN VERY LOW BIRTH WEIGHT (VLBW) NEONATES.

**AUTHORS:** Rozeta Sokou1, Aikaterini Konstantinid1, George Ioakeimidis1, Katerina Lampropoulou1, George Patsouras1, Evaggelia Tavoulari1, Panagiotis Chatzimihelakis1, Antonios Gounaris2.

**AFFILIATIONS:**
1. NICU, Nikaia General Hospital “Agios Panteleimon”, Piraeus, Greece
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**CONTENT:**

The safety of initiating enteral feeding or increasing milk volume while a umbilical artery catheter is still in place is a controversial issue in many neonatal intensive care units. These concerns are primarily related to a fear of precipitating gastrointestinal tract complications and especially necrotizing enterocolitis. The aim of this retrospective study was to investigate: 1) whether the presence of a umbilical arterial catheter (UAC) increased the incidence of gastrointestinal tract complications in enterally fed VLBW neonates, and 2) the correlation of the UAC indwelling time, and the rate of increase of the feeding volume with these complications.

During a period of 4 years, 174 neonates hospitalized in our NICU with BW <1500g were studied, and divided into 3 groups according to 1) the presence or absence of UAC in situ 2) the amount of administered milk at the time of UAC removal.

- **Group A:** 100 neonates [mean BW 1110 g (SD 226) and mean GA 29wks (SD 2.3)] without UAC in situ.
- **Group B:** 41 neonates [mean BW 1175 g (SD 263) and mean GA 29wks (SD 2.1)] with UAC in situ and enteral feeding with a milk volume covering 5% to 50% of daily fluid requirements.
- **Group C:** 33 neonates [mean BW 1130 grams (SD 258) and mean GA 28wks (SD 2.3)] with UAC in situ and milk volume of 50% to 100% of their daily fluid requirements. 9 neonates at the time of UAC removal were in full enteral feeding.

There were no differences in the demographic characteristics of the 3 groups, BW (p = 0.409) and GA (p = 0.458). There was no correlation between the presence of UAC in situ and the occurrence of NEC among the 3 groups (p = 0.664). In groups B and C, the average duration of UAC presence was 9 and 12 days (p = 0.017) and the mean daily increase rate of enteral feeding volume was 15ml / kg and 18ml / kg (p = 0.002) respectively. The incidence of NEC was 1 neonate in each group (p = 0.878). The incidence of mild gastrointestinal complications (increased gastric residuals, emesis, abdominal distension) for which no feeding discontinuation was necessary, was 10 newborns in group B and 7 neonates in group C (p = 0.750).

In our study, UAC presence in VLBW infants did not increase the risk for NEC. Additionally, it did not act as an inhibitory factor of either feeding initiation or the achievement of full enteral feeding. The incidence of gastrointestinal complications does not seem to correlate with the duration of UAC presence when enteral feeding is progressively increased at a safe volume rate.

**COI:** None declared
ID: 745

TITLE: RISK STRATIFICATION AND INFECTIOUS COMPLICATION’S IN GASTROSCHISIS MANAGED WITH PRE-FORMED SILO: EFFECT ON OUTCOMES.

AUTHORS: Rebecca Lee 1; Niyi Ade-Ajayi 2, Theodore Dassios 3, Ann Hickey 4

AFFILIATIONS: 1, 3, 4: Neonatal Intensive Care, King's College Hospital, London, UK
2: Department of Paediatric Surgery, King's College Hospital, London, UK

CONTENT:

Risk stratifying patients with gastroschisis has been proposed to facilitate early prognostication of outcomes and to counsel parents on the anticipated clinical course of their baby. Risk stratified outcomes have not previously been described in a cohort of babies exclusively managed with a staged reduction using a Preformed Silo (PFS) as the intended surgical choice of closure. Aims: To compare outcomes between patients stratified into ‘simple’ and ‘complex’ gastroschisis groups managed with PFS’s and investigate whether location of birth (surgical or non-surgical centre), time to closure, or sepsis events were associated with length of stay (LOS) or days of parenteral nutrition (PN).

A retrospective cohort study of babies managed with PFS for gastroschisis closure between 1st January 2008 and 31st December 2017 in a single tertiary NICU was performed. Babies were stratified into ‘complex’ and ‘simple’ gastroschisis groups, as per internationally recognised pathological findings, and whether they had the complication of an episode of blood culture positive sepsis. Location of birth was recorded from admission records. Total length of stay and PN days were selected as outcome measures. Data presented as medians (IQR), or counts (%). Non-parametric analysis, correlation coefficient and chi-squared statistical analysis was utilised. Multivariate linear regression assessed the independence of confounding variables.

100 patients were identified, 91 underwent PFS closure. Complete records for 77 infants: [38 male, gestation 36+6(35+3 – 38+0), birthweight 2458(1993 – 2757)g]. Mortality was 0%. Location of birth did not influence outcomes in terms or developing sepsis p= 0.499, whether a baby had ‘complex’ gastroschisis p= 0.282, PN days p= 0.293 or LOS p= 0.306. Sepsis (positive blood culture) affected the total LOS and PN days, p= <0.001 respectively. There was no association with days to closure and the incidence of sepsis p=0.582. Babies with complex gastroschisis showed a significant difference in the number of PN days and LOS p=0.001 respectively. Babies with complex gastroschisis were significantly more likely to have an episode of sepsis p = 0.033. Multivariate linear regression analysis identified that having complex gastroschisis or sepsis were independent risk influencers on LOS p= <0.001.

In a population of gastroschisis patients managed exclusively with PFS, ‘simple’ and ‘complex’ gastroschisis stratification appears to provide reliable prognostication for parents on PN days and LOS. Infectious complications from blood culture positive sepsis had a deleterious effect on outcomes in both the complex and simple groups individually. Efforts should be focussed on identifying modifiable factors to reduce these.

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COI: None declared.
ID: 789

TITLE: THE INFLUENCE OF PATENT DUCTUS ARTERIOSUS AND OTHERS HEART DISEASE ON OUTCOMES IN PATIENTS WITH NECROTIZING ENTEROCOLITIS

AUTHORS: The influence of patent ductus arteriosus and others heart disease on outcomes in patients with necrotizing enterocolitis (NEC)

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CONTENT:

The presence of patent ductus arteriosus (PDA) and others heart disease (HD) has unclear effects on outcomes in patients with necrotizing enterocolitis (NEC). The objective was to assess the influence of patent ductus arteriosus (PDA) and others heart diseases on necrotizing enterocolitis (NEC) outcomes.

A retrospective study of 271 infants with established NEC was performed. Outcomes were death, thrombocytopenia (1 mm (n=51) and with others heart disease (77). For the estimation of relative risks (RR) and their 95% confidence intervals, simple log-binomial regression (gross RR) and multiple regression models (adjusted RR) were adjusted using gestational age, apgar5, amniorrex time and use of corticoids as covariables.

Birth weight and gestational age were significantly lower in patients with PDA [mean (95% CI): 1063 g, 28.7 wk] than in those without PDA [mean (95% CI): 1474 g, 31.6 wk; P<0.05] and heart disease (HD) [mean (95% CI): 1474 g, 31.6 wk; P<0.05].

The risk of death was the same in NEC patients with PDA (35%) than in NEC patients without PDA (25%), and higher in HD (50%) [RR aj[PCA]|IC95%]=1,22 (0,80; 1,86)/RR aj[HD]|IC95%]=1,65 (1,15; 2,36)].

There wasn't difference in thrombocytopenia [RR aj[PCA]|IC95%]=1,15 (0,76; 1,76)/RR aj[HD]|IC95%]=1,03 (0,66; 1,60)] and pneumoperitoneum [RR aj[PCA]|IC95%]=0,92 (0,45; 1,91)/RR aj[HD]|IC95%]=0,61 (0,27; 1,37)].

There was difference in days of onset of symptoms (No PDA 11 days, PDA 15, HD 20, p-value < 0.01), hospitalization duration (No PDA 56 days, PDA 79, HD 69, p-value = 0.01), need of surgery (No PDA 26,5%, PDA 35,2%, HD 20,7%).

In patients with PDA, the presence of PDA is associated with an increased in hospitalization duration and need of surgery, but not with death. Heart Disease is associated with death and hospitalization duration.

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COI: None declared
Necrotizing enterocolitis (NEC) is one of the most common emergency situations in extremely low birth weight infants (ELBWI) [birth weight (BW)<1,000g], which often leads to surgical management. The aim of this study was to determine the incidence of NEC in ELBWI and compare the risk factors for outcomes in ELBWI with surgical NEC (sNEC).

We have performed a retrospective review of ELBWI with NEC and those among them who underwent a surgical procedure between January 2009 to December 2018. Data collected include: mode of conception, gestational hypertension, placenta abruption, chorioamnionitis, preterm/premature rupture of membranes (PPROM), uterus contractions (UC), use of tocolytic medications (TM), mode of delivery, gestational age (GA), BW, perinatal asphyxia, gender, intrauterine growth retardation, respiratory distress syndrome, intraventricular hemorrhage, PDA, enteral feeding, age at perforation, interval time between the offspring of NEC and the operation while the mode of operation and laboratory findings (Ht, PLT, PT, INR, aPTT). Data above were analyzed regarding their possible relationship with mortality.

During study period 5750 neonates were admitted to our NICU and 322 (5.6%) of them were ELBWI. Among these 322, twenty-five (7.7%) had developed NEC. Those infants had BW 775±146gr and GA 26.9±2.45w. Of the 25 infants with NEC, 19 (76%) were operated on. Following surgical treatment, 12 patients (groupA) recovered and were discharged, while 7 patients (groupB) died (mortality 36%). The majority of the deceased neonates were male (6). The median age of NEC onset, the GA [groupA: 27.3±2.94w vs groupB:26.3±1.87w, (p=0.048)] and the BW [groupA:787±160g vs groupB:772±105g, (p=0.824)] were not different between the two groups. From the above factors male gender (p=0.027) and PROM (p=0.013) were associated with mortality, while the presence of UC (p=0.027) and the use of TM (p=0.048) were associated with a lower incidence of mortality. No difference was noticed between the rest of the factors.

In our NICU the incidence of sNEC in ELBWI was low and the survival rate was high and similar to that of other multicenter studies. However, sNEC remains a major cause of morbidity and mortality.
TITLE: THE FREQUENCY AND RISK FACTORS OF NECROTIZING ENTEROCOLITIS THAT DEVELOPED BEFORE INTRODUCTION OF ENTERAL FEEDING IN VERY LOW BIRTH WEIGHT INFANTS

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CONTENT:

Necrotizing enterocolitis (NEC) is an important cause of morbidity and mortality in preterm infants. It has a multifactorial etiopathogenesis including prematurity, enteral feeding, hypoxia-ischemia, and inflammation. It was suggested to develop after enteral feeding in 90% of preterm infants. There is no data about NEC development before the introduction of enteral feeding in preterm infants. The aim of this study was to determine the risk factors for NEC development before enteral feeding in very low birth weight (VLBW) infants.

A total of 618 VLBW infants that were admitted to Neonatal Intensive Care Unit were included to this study. The exclusion criteria were refusal of parental consent, major congenital malformation and chromosomal anomalies. The infants with stage I NEC and/or infants who had diagnosis of spontaneous intestinal perforation (SIP) were also excluded. The infants were classified into 3 groups in terms of NEC development as infants with NEC before enteral feeding (NBF group), infants with NEC after enteral feeding (NAF group) and infants without NEC (no-NEC group). NEC was diagnosed according to clinical and radiographic findings, and were classified according to modified Bell's criteria.

A total of 90 and 65 infants were determined in NBF and NAF groups, respectively. No-NEC group included 453 infants. The mean gestational age (25.6±2.8 w) and birth weight (739±272 g) of infants in NBF group were significantly lower than NAF ve no-NEC groups (p<0.05). The infants in NBF group had significantly lower Apgar scores and the incidences of SGA, severe respiratory distress syndrome (RDS) and hemodynamic significant patent ductus arteriosus (hsPDA) were significantly higher in the NBF group (p<0.05). NEC significantly developed earlier (5.4±3.4 vs 15.6±11.5 d) in the NBF group compared with NAF and no-NEC groups. The frequency of perforation, need of surgery and mortality were also significantly higher in the NBF group (p<0.05).

Extremely low birth weight, presence of SGA, perinatal hypoxia-ischemia, need of resuscitation at birth, severe RDS and hsPDA were found as the main risk factors for NEC development before the introduction of enteral feeding. These infants had significantly higher perforation and mortality rates. Therefore, NEC can develop in VLBW infants with these risk factors without enteral feeding and may have a more severe progress.

COI: None declared
ID: 916

TITLE: THE IMPACT OF RISK FACTORS ON NECROTIZING ENTEROCOITIS OUTCOME AT VLBW NEONATES

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CONTENT:

Necrotizing enterocolitis is the most common gastrointestinal complication of preterm infant. The incidence of NEC increase when two or more risk factors are associated to the preterm birth. Onset typically occurs in infants aged between 2 weeks and 2 months. The incidence and the severity of the disease are higher if two risk factors are associated. Mortality is reaching 30% and is higher among infants who develop severe forms of the disease that require surgical treatment. NEC is accompanied by inflammation, ischemia and infection. The use of feeding protocols in clinical practice has led to a decrease in the incidence of the disease over the past years.

A longitudinal retrospective study was conducted at the Neonatology Department of the Gynecology Clinic I Cluj-Napoca, between 2014 and 2018. The clinic where the study was carried out is a third-level facility which serves an important part of the population in North-Western Romania (4 counties), preterm infants less than 32 weeks of gestation being admitted to this center.

The current study included all preterm infants who were diagnosed with NEC in the mentioned period. Data were systematically extracted from the records of Neonatology department. Modified Bell criteria were used for diagnosis. pH gas value were monitored in preterms with NEC. The aim was to find out if there was a significant link between the pH gas value and NEC onset. Data analysis was made using SPSS v. 25.

In the study period were admitted to the intensive care unit 596 (460 inborn and 166 outborn) preterm newborns having a gestational age of 32 weeks and birth weight below 1500 g, 37 (6.20%) of them were diagnosed with NEC. Of the NEC cases most were inborn, just 35.14% (13/37) were outborn. Influence of risk factors like growth restriction, missing of antenatal corticoids, preeclampsia, blood transfusion, enteral feeding type or metabolic acidosis on NEC’s severity and outcome were analyzed. In the study group 56.76% was enterally fed from 3rd day of life with own mother milk. At 16 cases formula was used as no milk banks in the country. There was a statistically significant link between BE under -10 and patients’ NEC type (Fisher exact test: P=0.007).

The analysis of risk factors in the study performed revealed a significant association of NEC with the acid-base status of the preterm infant, the study group showing a significant association of NEC with the value of excess bases. Exposure of preterm infants to formula determined a higher rate of unfavorable evolution through NEC compared to preterm infants who were exclusively fed with breast milk.

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COI: None declared