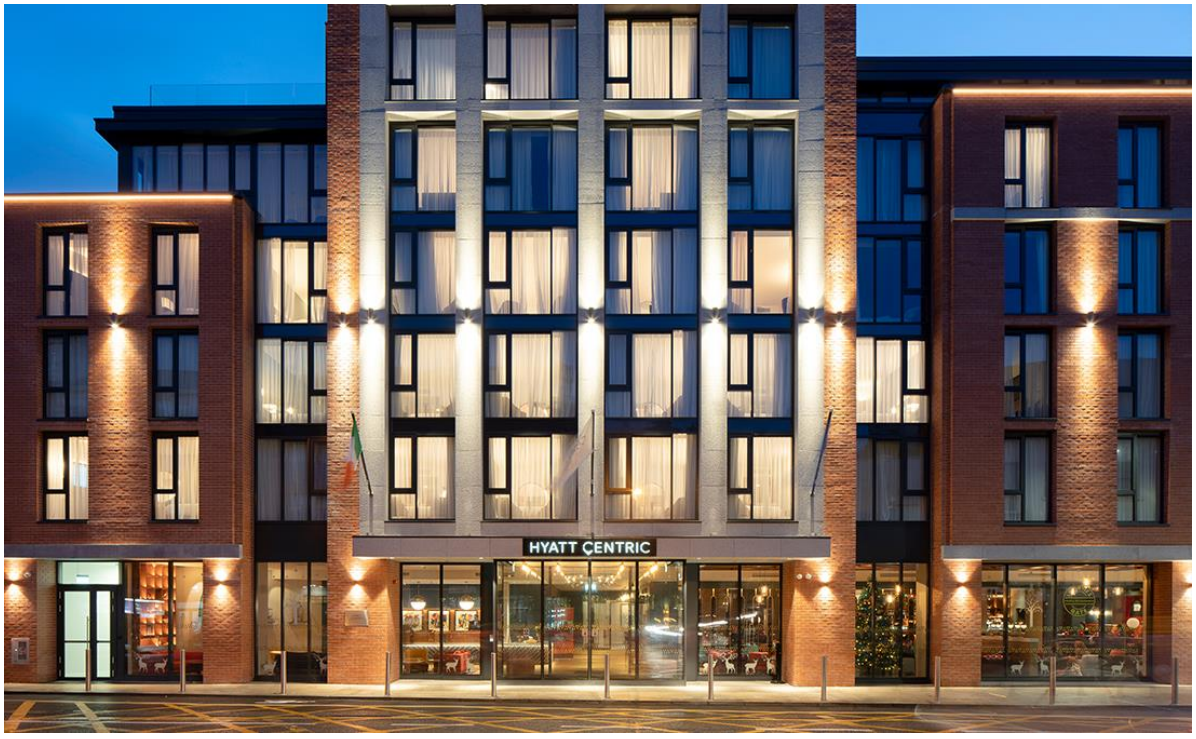
Irish Neonatal Society 14th Irish Neonatal Research Symposium 2024

Hyatt Centric Hotel, Dublin

Friday 22nd March 2024



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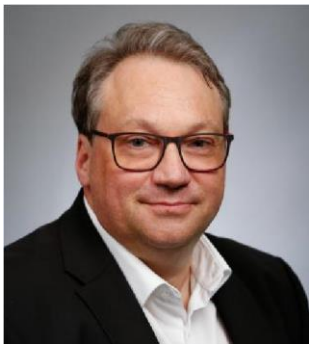
Guest Speaker Bios

Professor Nigel Hall

Nigel is Professor of Paediatric Surgery at the University of Southampton, Consultant Paediatric and Neonatal Surgeon and Clinical Lead for neonatal surgery at Southampton Children's Hospital. He is passionate about delivering high class surgical care to term and preterm neonates with a range of congenital and acquired surgical conditions. Particular areas of interest are Necrotising Enterocolitis and Oesophageal Atresia and he leads an active research program into both of these conditions aiming to generate an evidence base to support improvements in clinical care and ultimately improve patient outcomes.

Dr Janet Berrington

Janet is a neonatal consultant in Newcastle, UK. She has a background in neonatal immunology research in which she completed her MD. Her major research interests are NEC and the role of the microbiome, human milk and constituents including IgA and human milk oligosaccharides. She is also the manager of the Great North Neonatal Biobank – a tissue and sample repository of more than 1000 infants <32 weeks gestation. This facilitates much of the translational research that she has undertaken alongside the Stewart Lab, and is open to external researchers to apply to use. She has also undertaken large randomised controlled trials in neonates and was a co-applicant on the SIFT, ELFIN, MAGPIE and AZTEC studies amongst others.



Boris W.W. Kramer, MD, PhD

Training: MD (1997), medical doctorate (1998), Eberhard-Karls-Universität, Tübingen, Germany. Residency in pediatrics and training in Neonatology, University Hospitals Tübingen and Würzburg, Germany, with Prof. Dr. C.P. Speer (1999-2006). Research fellow with Prof. Dr. Alan H. Jobe, Cincinnati Children's Hospital, Ohio, USA (1999-2001).
Positions: Junior member of medical faculty, Würzburg (2006). Maastricht UMC+ (2006 to present): neonatologist and leader of experimental research group. PhD in 2007 and Professor for Experimental Perinatology since 2011. From 2013-2022 Director of Pediatric Research. Part-time position at the Institute of Women's Health, University College London, United Kingdom from 2016-2018. Clinical Professor University of Western Australia (2013-2023). Since 2022 chief medical officer Neuroplast BV, Maastricht, The Netherlands. Since 2023 Professor for Neonatology at Poznan University of Medical Sciences, Poland.
Several national and international research awards e.g. young scientist of ESPR (2003) and Dutch Society for Pediatrics (2008). Chosen as a "top talent" by the faculty of medicine (2008). Management classes at INSEAD, Fontainebleau, France.
Research interests: Stem cell therapy, Microbiome in necrotizing enterocolitis and bronchopulmonary dysplasia, development of lung, gut, brain, and immune system after preterm birth. Supervised 35 completed PhDs, 385 peer-reviewed papers in international journals, and 7 reviews in textbooks.
Editor: Associated editor of Pediatric Research and Neonatology.

Professor Claus Klingenberg

Claus Klingenberg is the lead consultant in the NICU at the University Hospital of North Norway in Tromsø and professor of paediatrics at UiT-The Arctic University of Norway. His main research interests are neonatal infections/inflammation, neonatal respiratory diseases and perinatal asphyxia. Klingenberg participates actively in the Norwegian Neonatal Network, he is a ESPR-section council member in the Infection and Inflammation section, and he collaborates with researchers in Europe and Australia.

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Programme

CPD Pending

08:15-09:00	**Arrival Tea/Coffee/Scones/Pastries & Fruit & Meet the Sponsors**
09:00-10:50	**Session 1 - Chairpersons: Prof Brian Sweeney, Dr Anne Doolan**
09:00-09:10	**Welcome – Prof. Eleanor Molloy**
09:10-10:10	**Original Research Presentations - 6 x 10 x Minute presentations**
09:10-09:20	**OF MICE AND PREMS: COMPARING PROTEOMIC TRANSITION IN A HUMAN AND MURINE COHORT** **Daniel O'Reilly[1,2],** Claire A Murphy[3,] Preeti Maurya[4], Luisa Weiss[2], John O'Loughlin[5], Elaine Neary[6], Afif El Khuffash[1,7,] Fionnuala Ní Áinle[2,8,] Naomi McCallion[1,7,] Craig Morrell[4,] Patricia Maguire[2] 1. Department of Paediatrics, Rotunda Hospital, Dublin 1 2. Department of Biomolecular and Biomedical Science, Conway Institute, UCD, Dublin 4 3. Department of Neonatology, Chelsea and Westminster Hospital, London, UK 4. Aab Cardiovascular Institute, University of Rochester, Rochester, NY, USA 5. Department of Laboratory Medicine, Rotunda Hospital, Dublin 1 6. Department of Neonatology, Liverpool Women's NHS trust, Liverpool, UK 7. Department of Paediatrics, Royal College of Surgeons in Ireland, Dublin 2 8. Department of Haematology, Mater Hospital, Dublin 7
09:20-09:30	**Amplitude integrated electroencephalography during retrieval of neonates at risk of hypoxic-ischaemic encephalopathy: a feasibility study in road and fixed-wing air transport in Western Australia** **Dr Mary O'Dea, [g,h],** Dr Varuna Chaudhary[a,b] ,Dr Alexander Wilsona,[b,c] , Dr Ela Chakkrapanie,[f] , Dr Jonathan Davis[a,b,c,d] [a]Newborn emergency transport service Western Australia, Perth Children's Hospital, Perth, Western Australia, [b]Telethon Kids Institute, Perth, Western Australia, [c]King Edward Memorial Hospital, Perth Western Australia, [d]University of Western Australia, Perth, Western Australia. [e]University of Bristol, UK, fSt Michael's Hospital, Bristol, UK, gCoombe Hospital, Dublin, Ireland, [h]Children's Health Ireland, Dublin
09:30-09:40	**DECREASE LEVELS OF MIR-20B, MIR-93 AND MIR-532 IN NEONATAL ENCEPHALOPATHY RESOLVE IN CHILDHOOD AND SIGNIFY POTENTIAL THERAPEUTIC TARGETS** **Johana M Isaza-Correa†[1-3,]** Eva M Jimenez-Mateos[†7], Eman Isweisi1[-3], Tim Hurley[1-3], Matthew McGovern [1-3,6], Moira O'Reilly[6], Mary O'Dea[1-3], Lynne A Kelly[1-3], Eleanor J Molloy[1-6*]. 1 Discipline of Paediatrics, Trinity College, the University of Dublin, Dublin, Ireland. 2 Trinity Translational Medicine Institute, Trinity College Dublin, Dublin, Ireland. 3 Trinity Research in Childhood Centre (TRiCC), Trinity College Dublin, Dublin, Ireland. 4 Neonatology, Children's Health Ireland at Crumlin, Dublin, Ireland. 5 The Children's Health Ireland at Tallaght, Dublin, Ireland. 6 Paediatrics, Coombe Women and Infants University Hospital, Dublin, Ireland. 7 Discipline of Physiology. School of Medicine. Trinity College Dublin, The University of Dublin. Dublin. Ireland. † These authors contributed equally.
09:40-09:50	**DELIVERY ROOM DEXTROSE GEL FOR PRETERM HYPOGLYCEMIA (THE GEHPPI STUDY): A RANDOMIZED PLACEBO-CONTROLLED TRIAL** **Graham King[#1,2],** Julie Sloan1, Peter Duddy3, Anne O'Sullivan1, Niamh Ó Catháin1, Jan Miletin1, Sharon Dempsey2, Shirley Moore2, Jyothsna Purna2, Christine Mc Dermott4, Margaret Moran4, Jean James5, Johannes Letshwiti5, Krystof Tabery1,6, Aneta Kubátová6, Jan Janota6, John Kelleher1 1 Paediatrics and Newborn Medicine Dept., Coombe Hospital, Cork Street, Dublin 8, Ireland 2 Neonatology Dept., National Maternity Hospital, Holles Street, Dublin 2, Ireland 3 Pharmacy Dept., Coombe Hospital, Cork Street, Dublin 8, Ireland 4 Neonatology Dept., Rotunda Hospital, Parnell Square, Dublin 1, Ireland 5 Neonatology Dept., University Hospital Galway, Newcastle Road, Galway, Co. Galway, Ireland 6 Neonatology Dept., Motol University Hospital, V Uvalu 84, 15006 Prague 5, Czech Republic
09:50-10:00	**DOES PLACENTAL PATHOLOGY IMPACT TOLERANCE OF LABOUR AND DEVELOPMENT OF NEONATAL ENCEPHALOPATHY: CASE-CONTROL STUDY** **Áine Fox1, 2,** Adam Reynolds1, 2, Aisling Dunne2, Emma Doyle3, Ailbhe Tarrant4, Miriam Martinez-Biarge5, Claire McCarthy6, Michael Geary 1, 6, Rocco Cuzzilla1,7, Breda Hayes 1, 2 1. Royal College of Surgeons (RCSI), Dublin, Ireland 2. Department of Neonatology, Rotunda Hospital, Dublin, Ireland 3. Department of Pathology, Rotunda Hospital, Dublin, Ireland 4. Department of Radiology, Rotunda Hospital, Dublin, Ireland 5. Department of Paediatrics, Hammersmith Hospital, London 6. Department of Obstetrics, Rotunda Hospital, Dublin, Ireland 7. Department of Neonatology, The Women's, Victoria, Australia

10:00-10:10	**A REVIEW OF OUTPATIENT PHYSIOTHERAPY DATA FROM THE FIRST YEAR OF ACORN IN THE NATIONAL MATERNITY HOSPITAL** **Eithne Lennon and Joanne Egan.** Physiotherapy Department, National Maternity Hospital, Dublin.
10:10-10:50	**Guest Lecture:** **The role of surgery for Necrotising Enterocolitis** **Prof. Nigel Hall, Consultant in Neonatal and Paediatric Surgery, Southampton University Hospital**
10:50-11:20	**Tea/Coffee/Display Posters and Meet the Sponsors**
Time	**Session 2 - Chairpersons: Dr Ann Hickey & Prof Eleanor Molloy**
11:20-12:00	**Guest Lecture:** **Early antibiotics and NEC – is there a link?** **Prof. Claus Klingenberg, Lead Consultant/Professor, University of North Norway**
12:00-12:40	**The Landscape of NEC in Ireland** **Gavin Kane,** Department of Paediatric Surgery, Children's Health Ireland at Crumlin **Contributors: Dr Ann Hickey, Dr Anne Twomey, Mr Brian Sweeney**
12:40-13:50	**Lunch in Main Restaurant followed by Tea/Coffee/Dessert in Sponsor Area**
Time	**Session 3 - Chairpersons: Prof Mike Boyle & Prof John Murphy**
13:50-14:50	**Original Research Presentations - 6 x 10 x Minute Presentations**
13:50-14:00	**ASSESSMENT OF PROLONGED PAIN IN THE NICU** E Butler1, **Sean Tamgumus1,2**, M Boyle1,2 1. Department of Neonatology, Rotunda Hospital, Dublin 2. Department of Paediatrics, Royal College of Surgeons in Ireland, Dublin
14:00-14:10	**PARENT CLASS FOR INTRODUCING SOLIDS TO HIGH RISK INFANTS POST DISCHARGE FROM NICU: NEXT STEPS** **Zelda Greene[1],** Aoife Tonge[2], Vanessa Winn[3], Jessica Caldeira[3,] Sarah Browne[3] [1]Speech and Language Therapy NICU, [2]Occupational Therapy NICU, [3]Dietetics NICU
14:10-14:20	**OUTCOMES AND CHARACTERISTICS IN TERM INFANTS WITH NECROTISING ENTEROCOLITIS AND CONGENITAL HEART DISEASE** **Sean T Kelleher [1,]** John Coleman[2], Colin J. McMahon[1,3,4], Adam James[1,5] 1. Department of Paediatric Cardiology, Children's Health Ireland at Crumlin, Dublin, Ireland 2. Children's Health Ireland at Crumlin, Dublin, Ireland 3. School of Medicine, University College Dublin, Belfield, Dublin 4, Ireland 4. School of Health Professions Education (SHE), Maastricht University, Maastricht, Netherlands 5. School of Medicine, Trinity College Dublin, Dublin, Ireland
14:20-14:30	**NECROTISING ENTEROCOLITIS AND NEUROLOGICAL AND NEURODEVELOPMENTAL OUTCOMES: A SYSTEMATIC REVIEW** **Alisha Mohammed and Vidushi Sharma[1],** Alexandra C Asman1**,** Simideleoluwa Adesokan1, Aaisha Al Wahshi1, , Chloe L Cheong1, Aliyah Jownally1, Camille Lartaud-Balosso1, Julia Rodighiero1, James Trayer1, Philip Stewart1, Aoife Branagan1,6, Edna Roche1,3,4, Judith Meehan1,2,3, Eleanor Molloy1,2,3,4,5,6*, 1 Discipline of Paediatrics, Trinity College Dublin, the University of Dublin, Dublin, Ireland 2 Trinity Translational Medicine Institute (TTMI), St James Hospital, Dublin, Ireland 3 Trinity Research in Childhood Centre (TRiCC), Dublin, Ireland 4 Endocrinology & Neurodisability, Children's Health Ireland (CHI) at Tallaght, Dublin, Ireland 5 Neonatology, CHI at Crumlin, Dublin, Ireland 6 Paediatrics, Coombe Women's and Infant's University Hospital, Dublin, Ireland

14:30-14:40	**URINE CULTURE IN NEONATAL LATE ONSET SEPSIS WORK-UP: A CLINICAL AUDIT** **Siti Aisyah Mohd Ramli[1],** Sarah Hoolahan[1], Susan Knowles[2], Deirdre Sweetman[1] [1]Neonatology Department, National Maternity Hospital, Dublin [2]Microbiology Department, National Maternity Hospital, Dublin
14:40-14:50	**NEONATAL DIABETES IN IRELAND OVER THE PAST 17 YEARS- CLINICAL PRESENTATION, MANAGEMENT, GENETICS AND OUTCOME: A CASE SERIES** **Yuxin Woon [1,2],** C. Card 1, L. Holcroft [1], C. Power [1, 6] , E. Somers [1], N. McGrath [3], S Glackin [4] , D. Cody [1, 7] , C McDonnell [5, 8] , S.M. O' Connell [1,6, 7] 1. Diabetes and Endocrinology, Children's Health Ireland at Crumlin, Ireland. 2. Paediatrics and Child Health, Cork University Hospital, Ireland 3. Paediatrics, University Hospital Galway, Ireland 4. Paediatrics, Sligo University Hospital, Ireland 5. Diabetes and Endocrinology, Children's Health Ireland at Temple Street, Dublin, Ireland. 6. Paediatrics, Royal College of Surgeons of Ireland 7. Paediatrics, University College Dublin, Ireland. 8. Paediatrics, School of Medicine, Trinity College Dublin, The University of Dublin, Dublin, Ireland.
14:50-15:30	**Guest Lecture** **"Inflammation in NEC and sepsis - two sides of the same coin?"** **Prof. Boris Kramer, Director of Paediatric Research, Poznan University of Medical Sciences**
15:30-15:45	**Short Coffee Break and Meet the Sponsors**
15:45-16:30	**Henry Halliday Lecture:** **NEC conundrums: diagnosis, pitfalls and relevance to research** **Janet Berrington, Consultant Neonatal Paediatrician in Newcastle and Honorary Clinical Senior Lecturer in Neonatal Medicine, Newcastle University, UK**
16:30	**Awarding of Research Presentation Awards**

OF MICE AND PREMS: COMPARING PROTEOMIC TRANSITION IN A HUMAN AND MURINE COHORT

Daniel O'Reilly[1,2], Claire A Murphy[3], Preeti Maurya[4], Luisa Weiss[2], John O'Loughlin[5], Elaine Neary[6], Afif El Khuffash[1,7], Fionnuala Ní Áinle[2,8], Naomi McCallion[1,7], Craig Morrell[4], Patricia Maguire[2]

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7. Department of Paediatrics, Royal College of Surgeons in Ireland, Dublin 2
8. Department of Haematology, Mater Hospital, Dublin 7

Background

Numerous biological changes occur in the hours and days after preterm birth. Whilst the physiological and anatomical changes have been reasonably well described, the molecular changes which accompany these are poorly understood. We sought to describe proteomic changes in the first 3 days of life in both preterm infants and C57bl/6 mouse pups. To examine how these changes compare to adults, a cohort of adult mice were also sampled and compared with pup data.

Methods: Platelet poor plasma from preterm infants (<30 weeks) on day of life 1 (n=10) and day of life 3 (n=10) collected as part of the EVENT study was enriched for extracellular vesicles (EVs) using ultracentrifugation and proteomic analysis was performed using Bruker TIMStof platform and a Data Dependent Acquisition (DDA) mode for identification of peptide peaks. Washed platelets from mice on day of life 1 (n=3 litters, 6-8 individuals per litter), Day of life 3 (n=3 litters, 6-8 individuals) and adult mice (n=3) were prepared and proteomic analysis performed on Thermofisher Astral Orbitrap platform with Data Independent Acquisition.

Results: 212 proteins were identified in the human neonatal cohort. 6 proteins were differentially expressed in a manner which was likely statistically and biologically significant (Fold Change >0.5, corrected p-value <0.05). Mouse platelets represented a more abundant source of proteins with 4839 proteins identified. No significant differences existed between mouse pup samples on day 1 or day 3, however large differences existed between both day 1 and day 3 pup samples and adult mouse samples with overexpression of proteins associated with transcription in neonatal versus adult samples.

Conclusions: Limited proteomic change occurs in the first days of life in premature infants and neonatal mice. Large changes can be demonstrated between adults and neonatal samples. The timing of proteomic changes has yet to be fully elucidated.

AMPLITUDE INTEGRATED ELECTROENCEPHALOGRAPHY DURING RETRIEVAL OF NEONATES AT RISK OF HYPOXIC-ISCHAEMIC ENCEPHALOPATHY: A FEASIBILITY STUDY IN ROAD AND FIXED-WING AIR TRANSPORT IN WESTERN AUSTRALIA

Dr Mary O'Dea[g,h], Dr Varuna Chaudhary[a,b] ,Dr Alexander Wilson[a,b,c] , Dr Ela Chakkrapani[e,f] , Dr Jonathan Davis[a,b,c,d]
[a]Newborn emergency transport service Western Australia, Perth Children's Hospital, Perth, Western Australia,
[b]Telethon Kids Institute, Perth, Western Australia,
[c]King Edward Memorial Hospital, Perth Western Australia,
[d]University of Western Australia, Perth, Western Australia.
[e]University of Bristol, UK,
[f]St Michael's Hospital, Bristol, UK,
[g]Coombe Hospital, Dublin, Ireland,
[h]Children's Health Ireland, Dublin

Background
Infants at risk of hypoxic-ischaemic encephalopathy (HIE) require early identification and therapeutic hypothermia. Amplitude-integrated EEG (aEEG) is limited to tertiary centres in Australia and delayed if travel is necessary for definite care. There are no data on aEEG during neonatal transport. We aimed to investigate whether portable aEEG can capture readable, accurate data while transporting infants at risk of HIE in Western Australia.

Methods
All infants at risk of HIE who required transport were eligible for recruitment. Following consent, low-impedance needle scalp electrodes were placed at C and P 3/4 positions and grounding. They were connected to an amplifier (Lifelines, UK) and tablet computer with EEG software (Kvikna, IS). The impedance (Z) threshold was set at >10KΩ.
Readability was assessed as:

- Total artefact: recordings were segmented into 15-minute epochs and reviewed independently by three blinded experts. Artefact: trace inconsistent with recognised aEEG pattern and ≥ two experts agreed.
- Movement artefact: Trend aEEG extracted from C3/4. Time trace >100 μV as % of total record.
- No. of Z alarms during each trace and their magnitude

aEEG descriptives were recorded and presented as proportion (%) or median (interquartile range). Recording was readable if >80% of traces were total/movement artefact-free and below the Z threshold. Infants transported by air vs road were compared by % movement artefact.

Results
Twenty infants at risk of HIE were enrolled and a total of 38 h of aEEG recorded. No artefact was scored in 160/170(89.9%) segments. Trend >100μV for 244s (0.2%) of total recording. There were Z notifications in 4/20(20%) traces, mean 4(1 – 6); magnitude 99.1(16.7 – 99.7)KΩ. There was no difference in movement artefact by transport mode.

Conclusion
aEEG is feasible and provides readable information during transport of infants at risk of HIE. The impact of earlier aEEG in this cohort needs to be assessed further.

DECREASE LEVELS OF MIR-20B, MIR-93 AND MIR-532 IN NEONATAL ENCEPHALOPATHY RESOLVE IN CHILDHOOD AND SIGNIFY POTENTIAL THERAPEUTIC TARGETS

Johana M Isaza-Correa†[1-3], Eva M Jimenez-Mateos†[7], Eman Isweisi[1-3], Tim Hurley[1-3], Matthew McGovern [1-3,6], Moira O'Reilly[6], Mary O'Dea[1-3], Lynne A Kelly[1-3], Eleanor J Molloy[1-6]*.

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Background: Following Neonatal Encephalopathy (NE) children are at high risk of brain injury and poor outcomes later into childhood. MicroRNA (miRs) are ~21–23-nucleotide single-stranded RNA (ssRNAs) sequences that can be players in the immunopathology of NE and could be used as prognosis markers.

Methods: the study included: Neonates with NE, control neonates, Children with NE and Control Children. Whole blood was stimulated with lipopolysaccharide (LPS). Total RNA was extracted from serum and identification of miR-20a, miR-20b, miR-93 and miR-532 was performed by TaqMan® Advanced miRNA Assays. miRNAs displayed as Delta CT levels.

Findings: Forty-six children were recruited (n=11-12 in each group), Neonates' samples were obtained in the first week of life and children's samples at age 2-5 years. miR-20b, miR-93 and miR-532 were significantly decreased in neonates with NE when compared to neonatal controls. miR-20b expression increased in children with NE compared to neonates with NE, to similar levels to childhood controls. Meanwhile, miR-93 decreased in childhood controls compared to neonatal controls. Following an endotoxin challenge, miR-20b significantly increased with LPS in children with NE compared to their paired neonatal NE sample. miR-20a, miR-93 and miR-532 did not change significantly after endotoxin treatment compared to their corresponding basal samples within the group or when comparing control children to either neonates or children with NE.

Interpretation: miR-20b has been linked to neuron development and proliferation, while miR-93 and miR-532-5p are associated with homeostasis mechanisms protecting cells under stress conditions, such as autophagy, apoptosis and cell viability. Decreased levels of miR-20b, miR-93 and miR-532 in neonates with NE could be evidence of brain injury during that stage of life. Alterations in miRNAs at a specific time point may result in neurodevelopmental conditions later in life. Analysis of specific target genes would help to identify pathologic pathways and might have therapeutic value.

DELIVERY ROOM DEXTROSE GEL FOR PRETERM HYPOGLYCEMIA (THE GEHPPI STUDY): A RANDOMIZED PLACEBO-CONTROLLED TRIAL

Graham King[1,2], Julie Sloan[1], Peter Duddy[3], Anne O'Sullivan[1], Niamh Ó Catháin[1], Jan Miletin[1], Sharon Dempsey[2], Shirley Moore[2], Jyothsna Purna[2], Christine Mc Dermott[4], Margaret Moran[4], Jean James[5], Johannes Letshwiti[5], Krystof Tabery[1,6], Aneta Kubátová[6], Jan Janota[6], John Kelleher[1]

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[3] Pharmacy Dept., Coombe Hospital, Cork Street, Dublin 8, Ireland
[4] Neonatology Dept., Rotunda Hospital, Parnell Square, Dublin 1, Ireland
[5] Neonatology Dept., University Hospital Galway, Newcastle Road, Galway, Co. Galway, Ireland
[6] Neonatology Dept., Motol University Hospital, V Uvalu 84, 15006 Prague 5, Czech Republic

BACKGROUND: Early establishment of nutrition and exogenous glucose delivery are critical interventions, during the golden first hour of postnatal life, for both very low birth weight and extremely low birth weight infants. Despite improvements in delivery room (golden hour) management, early hypoglycaemia occurs in approximately 20-40% of very preterm infants. It is these infants who often receive rescue intravenous dextrose boluses upon establishment of intravenous access. Our primary hypothesis was that buccal dextrose gel, given in the delivery room, would decrease rates of early hypoglycaemia in newborn infants born ≤ 32+0/40 weeks gestation.

METHODS: Multi-centre, randomized, placebo-controlled trial in the delivery room setting (clinicaltrials.gov number: NCT04353713). Infants born ≤ 32+0/40 weeks gestation were randomized to 40% dextrose or placebo buccal gel administered as soon as possible after birth. The primary outcome was hypoglycaemia < 1.8 mmol/L measured at the time of first intravenous access at admission to the neonatal intensive care unit.

RESULTS: Over 21 months, 169 newborns (33% of the calculated sample size) were recruited. Due to slow recruitment and limited research resources ongoing continuation of the study was deemed infeasible and a decision was made to stop the study. Analysis showed almost identical frequencies of the primary outcome in the dextrose (24/84) and placebo (25/85) gel groups (p=0.90).

CONCLUSION: Analysis of our limited results indicates that delivery room buccal dextrose gel does not decrease the rate of early hypoglycaemia in these preterm newborns. The requirement for antenatal consent significantly impacted on the slow rate of recruitment. Based on the safety (lack of adverse effects) seen in our trial, any future RCTs should include a waiver of consent to allow timely recruitment and a fully representative population.

DOES PLACENTAL PATHOLOGY IMPACT TOLERANCE OF LABOUR AND DEVELOPMENT OF NEONATAL ENCEPHALOPATHY: CASE-CONTROL STUDY

Áine Fox[1,2], Adam Reynolds[1,2], Aisling Dunne[2], Emma Doyle[3], Ailbhe Tarrant[4], Miriam Martinez-Biarge[5], Claire McCarthy[6], Michael Geary[1,6], Rocco Cuzzilla[1,7], Breda Hayes[1,2]

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4. Department of Radiology, Rotunda Hospital, Dublin, Ireland
5. Department of Paediatrics, Hammersmith Hospital, London
6. Department of Obstetrics, Rotunda Hospital, Dublin, Ireland
7. Department of Neonatology, The Women's, Victoria, Australia

Background:
The role of the placenta in the pathogenesis of Neonatal Encephalopathy (NE) is poorly understood. Understanding this relationship could enable improved identification of at-risk fetuses with individualised delivery plans. There is limited research comparing the differences in placental histology for babies with NE and healthy controls.
This study had two hypotheses:

1. Placental pathology is more common in babies born with NE compared with controls
2. Placental pathology is associated with severity and pattern of brain injury in NE

Methods:
This was a retrospective case-control study of babies with moderate or severe NE (born between 2006-2021 and treated at a single tertiary NICU) and healthy controls (born between Jan 2022-Jan 2023). Placental histology was reviewed using the 2016 Amsterdam consensus guidelines. MRIs were scored using the Weeke scoring system.

Results:
Eighty-one cases and 98 controls were included. Seventeen cases (21%) died and 39 (48%) had severe encephalopathy. Cases had a higher incidence of pathology compared with controls, this was statistically significant for histological chorioamnionitis (HCA), fetal vascular malperfusion (FVM) and delayed villous maturation (DVM).

Thirty-seven (46%) cases had histological chorioamnionitis (HCA) with 23 (62%) having fetal response. HCA was associated with higher intrapartum fetal heart rates and higher white cell counts compared with those without.

Of those with MRI available (n=64), there was no relationship between severity or pattern of brain injury and placental pathology.

Conclusion
This case-control study demonstrates that there is a higher incidence of placental pathology for babies born with NE compared with controls. This does not appear to relate to severity or pattern of brain injury. This suggests that placental pathology increases a fetus' susceptibility to intrapartum hypoxic ischaemia but this does not impact MRI brain scores in the neonatal period. Further research is required to investigate whether placental pathology impacts longer term outcomes.

Source of funding for the research:
Funding for this research was provided by The Rotunda Foundation and The National Women and Infants Health Programme Ireland. Funders had no involvement in the research study design, collection of data or analysis of data.

A REVIEW OF OUTPATIENT PHYSIOTHERAPY DATA FROM THE FIRST YEAR OF ACORN IN THE NATIONAL MATERNITY HOSPITAL

Eithne Lennon and Joanne Egan
Physiotherapy Department, National Maternity Hospital, Dublin.

Introduction:
Infants born prematurely are at higher risk of developmental problems. In 2022, structured inpatient developmental initiative (ACORN: Allied Care of at Risk Newborns) was introduced on the NICU, and the ACORN outpatient clinic was established for ongoing MDT developmental surveillance. All infants born within the NMH catchment area who were born at <30/40 or <1,500g were eligible for follow up in the ACORN clinic.
Here we take a look at the first year of physiotherapy data from the ACORN clinic.

Methods:
Neurological assessments used were the General Movements Assessment (GMA) and the Hammersmith Infant Neurological Examination (HINE). The Alberta Infant Motor Scales (AIMS) was used to assess of gross motor skills.

Results:
Results from the HINE showed that at 3 months CGA 27.3% (n=33) achieved a global score ≤57, which was sub-optimal. However, this increased over time with 100% (n=23) scoring in the optimal range by 9 months CGA. Two infants presented with ≥3 asymmetries at 3 months CGA, which persisted in one of these infants at 9 months CGA.
All infants showed Normal Fidgety on the GMA.
Gross motor scores showed only 9.4% (n=32) scored ≤10th percentile at 3 months CGA. However, 50% (n=28) scored ≤10th percentile at 9 months CGA.

Conclusions:
Gross motor delay was more evident at 9 months CGA, as the complexity of age-appropriate motor tasks increased, demonstrating the importance of ongoing motor surveillance. Also, we need to consider using a motor assessment that is more sensitive in the first few months.
The improvement in HINE scores indicates these infants did not have a significant neurological impairment. However, persistent asymmetries of one infant required follow up.
These high-risk infants need ongoing neuromotor monitoring following discharge from NICU. An early therapeutic motor intervention would likely benefit this cohort.

OUTCOMES IN SURGICAL NECROTISING ENTEROCOLITIS IN IRELAND FOR INFANTS REACHING CHILDREN'S HEALTH IRELAND (CHI)

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BACKGROUND

Necrotising enterocolitis (NEC) is the most common preterm neonatal surgical emergency. The aim of the current study was to generate national outcomes data on surgical NEC.

METHOD

All patients in the Republic of Ireland who underwent laparotomy for NEC were identified over a 10 year period (2012-2022). The following was obtained for each patient: gender, gestational age, birth weight, co-morbidities, intraventricular haemorrhage (IVH), feeding prior to developing NEC, length of bowel resection in centimetres, histopathology, presence/absence of ileocecal valve after surgery, stoma formation, time from maternity hospital referral to surgery, length of hospital stay and mortality.

RESULTS

133 patients underwent laparotomy for NEC over the study period; 81 males and 52 females (ratio 1.5:1). Median gestational age was 27.3 weeks. Median birth weight was 925 grams. 86 (64.7%) were very low birth weight (VLBW) infants. 95 (71.4%) patients underwent bowel resection with a median of 11cm resected. 100 (75.2%) had a stoma formed. 106 (79.7%) were left with an intact ileocecal valve. 43 (32.3%) had a 'Penrose' drain inserted prior to laparotomy. 11 (8.3%) were labelled spontaneous intestinal perforation (SIP). 13 (9.7%) had 'NEC totalis'. Median time from maternity hospital referral to surgery was 9hrs 45 mins. Overall mortality was 23.3% patients. Mortality rate in VLBW infants was 30.2%. The median time to death was 32 days.

CONCLUSION

With an overall mortality rate of 23.3% over 10 years, this study suggests that outcomes of surgical NEC in the Republic of Ireland are good if the child reaches a tertiary surgical referral centre. However, the authors acknowledge that some surgical NEC infants never make it to CHI for surgical assessment or may be unfit for surgery when assessed.

ASSESSMENT OF PROLONGED PAIN IN THE NICU

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Background

The critically ill neonate is subjected to numerous interventions and procedures that result in immediate or prolonged pain in NICU. Analgesia and sedation for interventions and procedures, is now a common practice in the NICU. The effectiveness of this practice is often suboptimal, thus leading to pain being undertreated and often unrecognised.

To reduce the impact of painful stimuli and prolonged pain, a validated pain assessment tool should be used at regular intervals, allowing the clinician to treat pain using an individualised approach.

Our aim was to audit the use of our pain assessment tool and evaluate analgesia being used.

Methods

A retrospective chart review of all infants admitted to NICU who potentially would be subjected to prolonged pain from the period January 2023 to July 2023.
The data collected was analysed using descriptive statistics.

Results

46 babies were admitted that were exposed to interventions with prolonged pain/discomfort. 74% were prescribed analgesia and none of the infants had a pain score recorded.
83% were term and 86% of extreme preterm infants exposed to pain received analgesia whereas only 50% of late preterm or preterm infants did.
All babies who received therapeutic hypothermia or had a chest drain in situ received analgesia. However only 86% of infants with NEC and 73% of babies receiving prolonged invasive ventilation received analgesia.

Conclusion

Our term and extremely preterm babies receive analgesia much more consistently than our preterm and late preterm populations.

While visually obvious conditions such as chest drains or therapeutic hypothermia received analgesia, babies with NEC or prolonged invasive ventilation did not.

Of note, no baby received a pain score despite this being within our guidelines. This warrants re-education and a change in our culture towards pain assessment to guide the requirement more accurately for analgesia for all neonates.

PARENT CLASS FOR INTRODUCING SOLIDS TO HIGH RISK INFANTS POST DISCHARGE FROM NICU: NEXT STEPS

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Introduction: Transition to solids can be difficult for families. Internationally a significant number of preterm infants are reported to have feeding difficulties up to school age. We hypothesized that early intervention around solids introduction specifically tailored for parents of high risk NICU infants would provide a smoother transition to solids and provide the team with a framework for timely MDT follow up.

Methods: A monthly live online class was held. It was co-hosted by neonatal dietitians, SLT, and OT. Parents were prospectively recruited to the class before discharge or identified by professionals in clinic. After each class an online survey/resource sheet was issued to parents for feedback.

Results

June 2023 – Jan 2024 six classes took place. 77 parents invited, 38 (49.35%) attended, of these 18 (49%) completed survey. Predominantly preterm population. Of the attendees, 13 required MDT follow up for feeding problems. 100% of parents found the class helpful, had better understanding about guidelines for readiness to feed, baby skills required, equipment and utensils to use, types of food, how chewing develops, gagging vs choking. Parents reported anxiety about weaning, they liked the live supportive expert led class with a specific NICU focus. 83% felt more confident about starting solids.

Conclusion: Parents found the class useful and liked the NICU focus. 13 families needed MDT support to transition to solids thereby informing service delivery. Feedback highlighted fears and concerns about feeding that should inform early infant feeding practices and coordinated service planning. Efforts to improve attendance rate will be considered.

OUTCOMES AND CHARACTERISTICS IN TERM INFANTS WITH NECROTISING ENTEROCOLITIS AND CONGENITAL HEART DISEASE

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Background

Congenital Heart Disease (CHD) is a significant risk factor for the development of necrotising enterocolitis (NEC). Existing literature does not differentiate between term and preterm populations in this group. Long-term outcomes of these patients are not well understood. The aim of this study was to investigate the baseline characteristics and outcomes of term normal birth weight infants with CHD who developed NEC.

Methods

A retrospective review was performed of infants from a single tertiary centre with CHD who developed NEC of Bell's Stage 1-3, over a ten-year period. Inclusion criteria was those born greater than 36 weeks' gestation and birth weight over 2500g. Exclusion criteria included congenital gastrointestinal abnormalities. Sub-group analysis was performed using Fisher's exact test.

Results

Twenty-five patients were identified, with a median gestational age of 38 weeks. Patients with univentricular physiology accounted for 32% (n=8) and 52% of patients (n=13) had a duct-dependent lesion. Atrioventricular septal defect (AVSD) was the most common cardiac diagnosis (n=6, 24%). 10 patients (40% of total) had a confirmed genetic diagnosis with patients with trisomy 21 accounting for 20% of total cases. Mortality within 30 days of NEC was 20%. Long-term mortality was 40%, which increased with increasing Bell's Stage. Surgical management of NEC (e.g. laparotomy, drain insertion, stoma formation) was required in 36% (n=9). Infants with trisomy 21 were significantly more likely to require surgical management of NEC ($p<0.05$).

Conclusion

Not previously described in term Infants, is the high rate of trisomy 21 and AVSD. This may reflect higher baseline incidence in our population. Infants with trisomy 21, were more likely to develop surgical NEC. Mortality at long term follow-up was high in patients with Bell's Stage 2-3.

NECROTISING ENTEROCOLITIS AND NEUROLOGICAL AND NEURODEVELOPMENTAL OUTCOMES: A SYSTEMATIC REVIEW

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BACKGROUND: Necrotizing enterocolitis (NEC) is a life-threatening intestinal condition predominantly affecting premature infants. While its incidence may fluctuate across various neonatal intensive care units, the typical prevalence rate among very low birth weight (VLBW) infants, categorized as those with an initial recorded weight below 1500 grams, averages around 7%. This systematic review aims to examine early and late neurological and neurodevelopmental outcomes in premature neonates following NEC.

METHOD: This systematic review followed Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Two investigators independently searched four databases for studies published since 2000 reporting the neurological or neurodevelopmental impact of NEC in preterm infants (PubMed, Embase, Cochrane Library and Google Scholar). Covidence facilitated study selection, with at least three reviewers independently assessing titles, abstracts, and full texts.

RESULTS: A total of 1,691 abstracts were screened and 44 papers were included. Seven studies reported early neurodevelopmental outcomes up until the corrected age of 12 months, 22 reported later outcomes, 13 reported NEC-associated brain lesions, and 20 discussed the pathogenesis of NEC-related neurological damage. Systemic inflammation triggered by NEC was the main mechanism of brain injury as well as impaired cerebrovascular autoregulation, low cerebral oxygenation levels, and nutritional status. Intraventricular haemorrhage was the most common brain lesion found in infants with NEC (20.5%), followed by white matter injury (18.5%) and cystic changes (17.3%). Remarkably, there was a decline in the extent of neurological and neurodevelopmental impairment as age advanced, with school-aged children exhibiting a lower level of impact at the population level.

CONCLUSION: NEC is associated with auditory, visual, cognitive and motor impairments especially for patients requiring surgery. Understanding the multifaceted pathogenesis of NEC requires a multidisciplinary approach to enhance long-term outcomes. Future research should focus on establishing standardized and evidence-based methods for assessing and minimizing the long-term impact of these impairments.

URINE CULTURE IN NEONATAL LATE ONSET SEPSIS WORK-UP: A CLINICAL AUDIT

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Background: The prevalence of neonatal urinary tract infection (UTI) is between 7-20%, being higher in preterm and low birth weight infants. In neonates beyond 72 hours of life with signs of sepsis, urine culture has shown significant yield even in the absence of bacteraemia. Collection of a sterile urine sample for culture therefore has been considered internationally to be part of late-onset sepsis (LOS) work-up. We evaluated the compliance of our neonatal intensive care unit (NICU) practice with this standard.

Methods: Between January 2018 and July 2023, we analysed 762 episodes of LOS evaluation, for neonates over 72 hours of life.

Results: Urine culture was performed in 142 episodes (18.5%), with the majority being collected after 1 hour of first intravenous antibiotics administration (88.6%). Clean catch was the main method of collection (86%). UTI prevalence was 0.9% (7) with the majority being negative for bacteraemia (71%). *Klebsiella* species was the commonest uropathogen (42%).

Conclusion: UTI can be missed if urine is not considered as part of initial LOS evaluation especially if blood culture is negative. Delayed urine collection decreases the likelihood of diagnosing a UTI and identifying a uropathogen. Staff education is important to enhance awareness and involving parents in urine collection may improve overall compliance.

NEONATAL DIABETES IN IRELAND OVER THE PAST 17 YEARS- CLINICAL PRESENTATION, MANAGEMENT, GENETICS AND OUTCOME: A CASE SERIES

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Background: Neonatal diabetes mellitus (NDM) is a rare form of diabetes presenting by 6 months of age. It typically occurs due to a pathogenic genetic variant, presenting as permanent (PNDM), transient (TNDM) or syndromic (SNDM). Those with pathogenic variant affecting the K_{ATP} channel may respond to oral sulphonylurea instead of insulin.

Aim: To review the presentation, genotypes, management and outcomes of patients diagnosed with NDM in Ireland over 17 years.

Methods: Data on NDM cases 2006-2023 in Ireland were collected through contributions from Paediatric Endocrinologists and electronic databases. Research and Ethics Committee approval was granted (REC-250-23).

Results: Nineteen cases were identified; nine PNDM, seven TNDM and three SNDM. Age of diabetes diagnosis ranged between 1 day to 11 months. Seven cases of PNDM had identifiable pathogenic variants; *KCNJ11* (n=6), *INS* (n=1) and two without genetic diagnosis. Six cases of TNDM were due to 6q24 methylation defect and one due to *ABCC8* pathogenic variant. All SNDM cases had Wolcott-Rallison Syndrome, due to *EIF2AK3* pathogenic variant. A parent of a case with *KCNJ11* was diagnosed, resulting in successful transition off insulin to sulphonylurea. Treatment with sulphonylurea was more successful when started at a younger age. All cases of 6q24 methylation defects presented with intrauterine growth restriction, prematurity and TNDM.

Conclusions: The spectrum of presentation and management of NDM are highlighted by this series. Early clinical suspicion and genetic diagnosis is key to management of NDM. In PNDM, early use of sulphonylurea can result in better diabetes control, avoiding the need for insulin.

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COMPARISON BETWEEN A LOW VOLUME MICRO METHOD AND THE STANDARD LABORATORY METHOD TO MEASURE NEONATAL HAEMOGLOBIN AND HAEMATOCRIT VALUES

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Background: Neonates have a low total blood volume and are at risk of anaemia from multifactorial causes. Iatrogenic anaemia caused by repeated blood sampling to monitor laboratory parameters can contribute to the need for transfusion. "Point of care" laboratory equipment uses smaller volume of blood for analytic determinations and may, therefore, help to prevent anaemia.

Materials and methods:

We compared the results of haematological parameters measured using a standard laboratory method and a "point of care" micro method, with the aim of validating the use of this latter method in clinical practice in a tertiary neonatology centre.

A prospective observational study was conducted with 43 paired samples blood test's results. Capillary, venous, or arterial blood samples analysed through point-of-care testing (POCT) were systematically matched with corresponding blood samples sent for full blood count (FBC) analysis. Both sets of samples were simultaneously obtained from the same infant, either at the same time or within the same day.

Results:

The concordance between the data obtained with the two analysers, expressed as the intraclass correlation was 0.916 (95% CI: 0.6-1.4) for Haemoglobin values and 0.869 (95%CI:0.040.07) for Haematocrit values. Both were statistically significant (P value= <0.05).

Conclusion:

The concordance between the values obtained with the two analysers was high for both parameters.

This comparative analysis serves as a foundational framework for a Quality Improvement Project aiming to further explore strategies in larger patient cohorts for reducing blood loss and minimizing the risk of iatrogenic anaemia.

THYROID DYSFUNCTION OF PRETERM NEONATES: A SYSTEMATIC REVIEW OF SCREENING AND MANAGEMENT

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Background: Preterm infants are at high risk of thyroid dysfunction and its detrimental sequelae. Despite available guidelines, timing of screening and optimal treatment of premature neonates remains controversial. Thus, the aim of this paper was to review the literature of thyroid dysfunction in preterm neonates related to current screening and management.

Method: In a systematic review in accordance with the PRISMA statement the following keywords were searched: ("thyroid dysfunction" OR "hypothyroidism" OR "congenital hypothyroidism" OR "cretinism" or "thyroid disease") AND ("preterm neonates" OR " preterm infants'' OR "premature") AND ("screening" OR "investigation" OR "testing") AND ("therapy" OR "medication" OR "replacement" OR "treatment" OR "levothyroxine" OR "management") in international electronic databases Medline OVID, Embase, Cochrane and PubMed. All eligible studies were read in full, and the suitability of each study was assessed. The resulting dataset related exclusively to the screening or management of thyroid dysfunction in preterm neonates.

Results: In this review, 848 studies were initially found from the 4 international electronic databases. Of the 163 studies screened for eligibility, 34 were included [20 studies related to screening; 14 studies related to management]. From the reviewed articles pertaining to screening, a minimum repeat screen at 2 weeks after birth was supported, with some studies calling for repeat screening at 2 weeks, 4 weeks, discharge and/or when neonatal weight exceeds 1500g. Thyroid Stimulating Hormone (TSH) and Thyroxine (T4) [and/or free T4] in combination are recommended to test for thyroid dysfunction to improve diagnostic specificity. Management with levothyroxine is recommended for the treatment of congenital hypothyroidism. However, inconsistencies persist across current practice in relation to dosing, timing and duration of treatment with levothyroxine.

Conclusion: There is a requirement for further research in this area with potential to develop standardised screening and management guidelines for thyroid dysfunction in preterm neonates.

PREVENTING ORAL AVERSION IN INFANTS WITH CONGENITAL DIAPHRAMATIC HERNIA USING AN IMPROVEMENT SCIENCE APPROACH

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Background

Feeding difficulties, most commonly oral aversion(OA) are noted in up to 75% of infants with Congenital Diaphragmatic Hernia (CDH). Oral Aversion (OA) is a learnt aversion to feeding which develops when an infant repeatedly experiences discomfort during feeding. This may lead to sub-optimal nutrition and prolonged tube feeding OA is known to impact development and quality of life outcomes.

Our centre is the sole CDH referral centre for infants with CDH in Ireland (20 cases pa). High OA rates of 71% in CDH infants were identified from a local audit in 2022, driving a quality improvement initiative to improve feeding outcomes.

Method

Using improvement science-based quality improvement (QI) methods - we devised a package of evidence-based interventions, designed to prevent OA. Co-production with multidisciplinary stakeholders and families was a vital component to success. Sustainable educational tools included a staff education video, a standard feeding protocol, and a standardised assessment of oral aversion and family information leaflet.

QI methods identifying key issues and solutions included: process maps, fishbone diagrams, driver diagrams and Gantt charts. We developed a SMART aim statement. PDSA cycles studied the impact on each infant.

Results:

OA reduced to 10% in a cohort of 10 infants (from a baseline data rate of 71%). Median length of stay reduced from a 68 to 31 days, with significant cost savings. First speech and language therapy review reduced from median day 38 to day 12. Education was delivered to nursing, medical, surgical, and therapy staff. Early oral care with EBM was achieved in 100% of cases. A balancing measure of improved breastfeeding rate at discharge was found (70% exclusive breastfeeding and 20% receiving breast milk).

Conclusion:

Using improvement science-based processes to identify root-causes, develop education tools and influence stakeholders resulted in improved and sustainable feeding outcomes in our cohort.

CONTRIBUTION OF SPEECH AND LANGUAGE THERAPY (SLT) IN ESTABLISHING A NEONATAL DEVELOPMENTAL FOLLOW UP PATHWAY AT THE NATIONAL MATERNITY HOSPITAL (NMH) DUBLIN

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National Maternity Hospital (NMH)/[8]Trinity College Dublin

Extremely preterm infants are at high risk for delays in feeding skill acquisition and speech/language and communication progression. Supporting early development in the neonatal unit and in the period after discharge has a positive impact on outcomes. Our recently established SLT service contributed to developing a post discharge developmental pathway that could be a national template for identifying early follow up for these high risk infants.

Methods: All eligible infants <1500g/<30 weeks gestation were invited to a new developmental surveillance clinic at 3 monthly intervals from June 2022 – June 2023. SLT attended when possible. Communication was assessed using the ROSSETTI Infant Toddler Language Scales and REEL-4. Feeding was assessed through parent interview and follow-up clinical observation if clinically indicated.

Results: There were 91 attendances by 38 eligible infants. SLT was in attendance for 41 (45%) of possible appointments. Feeding and communication issues are also identifiable at all stages of assessment (3/6/9/12/ months) but problems in these skills begin to emerge more at the 9 month review with 5/8 (62.5%) of infants having feeding problems and 3/8 (37.5%) have communication problems at that time.

Discussion: SLT could not attend all appointments. 9 month appointments appear to be capture emerging issues with feeding (62.5%) and communication (37.5%). This has not been previously reported. The team now prospectively recruits parents into a new online weaning webinar from 4 months CGA to try and prevent feeding difficulties and promote good communication skills at mealtimes. New face to face post discharge parent classes are underway. Earlier referral to community services is possible. A new follow up pathway was developed.

Conclusion: Delays in feeding and communication are apparent with peak presentation at 9 month CGA. This pathway should have a positive impact on speech, language and feeding outcomes.

FEEDING ISSUES AFTER NICU: PROFILE OF INFANTS ATTENDING FOR MULTIDISCIPLINARY FEEDING MANAGEMENT AT THE NMH

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[1]Speech and Language Therapy NICU, [2]Occupational Therapy NICU, [3]Dietetics NICU

Historically the NMH has not captured feeding difficulties in high risk NICU infants post discharge. In 2022 the ACORN developmental team introduced surveillance clinics identifying feeding difficulties resulting in a monthly weaning class for parents in June 2023. This retrospective review profiles our high risk infants identified with feeding difficulties to direct timely service delivery.

Methods: Infants were identified from the weaning class database from June 2023-Jan 2024. All infants had interventions with SLT, OT, dietitians. Retrospective chart review assessed demographic information, when feeding difficulties were identified, number of professional contacts, and nature of feeding difficulty.

Results: 13 infants identified, 11 preterm*. At discharge, 9 infants breastfeeding/bottle top up, 3 bottle feeding, 1 NPO. Feeding difficulties identified at different timepoints- 2 ongoing issues, 9 via ACORN clinics (7 between 9-12 months), 2 via consultant referrals (1 at 4 months/1 at 7 months). There were 94 feeding related AHP clinical contacts; 56 Dietitian, 27 SLT, 7 OT, 4 Social Work. Feeding difficulties: fear of choking, problems biting/chewing, self-feeding, progressing textures, fear of weight loss/growth problems, poor mealtime communication, need for mealtime distractions.

Conclusion: This is a high risk group infants with prolonged length of stay in NICU. Parental stress/anxiety, fear of choking, experiences of volume and growth driven feeding practices appear to underpin difficulties identified. The majority of infants were identified late when problems were entrenched. Early intervention (parent weaning class with a NICU specific focus) is now in place for all high risk infants post discharge from 4 months CGA.

HOW ARE THE ACORN CLASS OF 2022 DOING ON BAYLEY ASSESSMENT AT 12 MONTHS CORRECTED AGE?

Zelda Greene[1], Aoife Tonge[2]
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Introduction: In 2022 a multidisciplinary developmental programme was established in NICU (ACORN Allied Care of at Risk Newborns). This supports development in NICU with surveillance at 3 monthly intervals. All high risk premature infants have a Bayley assessment at age 2 years. This is the first cohort to have this standardised assessment done at age 1.

Method: All infant enrolled in the NMH ACORN programme were offered a 1 year (CGA) developmental review using BSID 3 assessment conducted by SLT/OT. Subtests administered: Cognitive, Language, Motor. All infants were born in 2022.

Results: 38 eligible infants, 23 assessments completed (to date), 9 scheduled, 4 DNA, 1 out of country, 1 lost to follow up. 16 infants had all three subtests fully completed. Average scaled scores (SS) and composite scores (CS) were compiled. Cognitive SS 10.6 (6-14)/ CS 103 (80-112), Receptive language SS 9 (5-14)/ Expressive language SS 10.7 (7-14)/ Language CS 100.5 (77-124). Fine motor SS 9.75 (8-15)/ gross motor SS 8.6 (7-10)/Motor CS 94.4 (88-112). 5 required onward referral (1 CDNT, 1 primary care OT, 1 Primary Care SLT, 1 Primary care physio & SLT, 1 monitor). Of the 7 incomplete assessments 4 required onward referral. Overall 9 of 23 infants require onward referral (39%). 7 of 23 infants had delayed receptive language SS (30%)

Conclusion: 39% of our high risk infants have difficulties at one year CGA. Earlier referral to community teams is initiated. Discrepancies between receptive language SS vs language composite scores may be masking receptive language difficulties.

DUAL DUODENAL PATHOLOGY RESULTING IN DIAGNOSTIC DILEMMA

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BACKGROUND:

In rare cases of newborns presenting with bilious vomiting and intestinal malrotation, a second duodenal pathology may be present. Mostly, this comes in the form of an obvious duodenal atresia which can be identifiable at the time of surgery. However, in a very rare number of cases, a duodenal web may be associated with malrotation and this causes a diagnostic dilemma for the radiologist and surgeon.

METHOD:

We carried out a retrospective chart review of a single case study. This term neonate underwent an upper gastrointestinal (GI) contrast study, day 3 of life due to bilious vomiting. During the study, contrast reached the 3rd and 4th part of the duodenum but appeared to be held up here. After some time, a small amount of contrast moved on into the rest of the small bowel.

RESULTS:

In this case, the patient was brought to laparotomy and underwent a LADD's procedure to correct their intestinal malrotation. The surgeon passed a nasogastric (NG) tube into the duodenum and this appeared to cross the duodenum into the small bowel. The patient continued to have bilious NG aspirates and abdominal distension post-operatively. A repeat upper GI contrast study was suspicious for ongoing duodenal obstruction. The patient returned to the operating theatre for duodenoduodenostomy (bypassing a duodenal web).

CONCLUSION:

This is a rare case with double duodenal pathology that is difficult to diagnose radiologically and surgically. Initial discussion with parents needs to highlight the difficulty of diagnosing a co-existent duodenal web with intestinal malrotation. Acknowledging that such variations exist will avoid difficult discussions postoperatively.

SMALL BOWEL HIRSCHSPRUNGS DISEASE – DIAGNOSTIC AND MANAGEMENT DILEMMAS

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BACKGROUND:
The incidence of Hirschsprung's disease (HD) is approximately 1 in 5000 live births while total colonic Hirschsprung's disease affects 1 in 50 to 100,000 births. Ultra-long segment HD extending into the small bowel is extremely rare with only small case-series and case reports documented. We report one of these rare cases, highlighting the difficulties with diagnosis and management.

METHOD:
Retrospective chart review of a single case. This was a term baby who presented with bilious vomiting and delayed passage of meconium. After an upper gastrointestinal (GI) contrast study ruled out intestinal malrotation, the child was taken for surgery for presumed meconium ileus or intestinal atresia. An abnormal segment of small bowel was resected and primary anastomosis formed.

RESULTS:
Following two further laparotomies for presumed small bowel obstruction, a genetic finding of mutation in the RET proto-oncogene triggered thoughts of Hirschsprung's disease. Upon, the fourth laparotomy, ganglion cells were detected only 20cms from the duodenojejunal flexure. Management was tapered accordingly and an ultra-high jejunostomy was formed. The child is currently on oral diet and 15 hours of total parenteral nutrition.

CONCLUSION:
Small bowel HD causes equal problems with diagnosis as much as management due to the rarity of the condition and complex presentation. In this case, genetic studies and mutation of the RET proto-oncogene were the key to diagnosis.

VALIDATION OF BREASTFEEDING ASSESSMENT TOOL USING TEST WEIGHTS

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Background

Breast milk is the mainstay of nutrition for premature infants, with nutritive sucking beginning around 33-34 weeks gestation. However, accurately measuring intake during breastfeeding poses challenges. The Neonatal Breastfeeding Assessment Tool (BAT) is a subjective measurement tool used to gauge breastfeeding adequacy. Our unit has added to the evidence of the utility of test weights in preterm infants in line with previous validation studies. This study seeks to validate the BAT in comparison to test weights.

Methods

A prospective cohort study was performed in a single tertiary neonatal unit. Research ethics committee approval was obtained. Mothers of preterm infants (<35 weeks) eligible for trial of oral feeding and who wished to breastfeed were consented. Test weights were obtained before and after breastfeeding using a validated SOP. The percentage of infant's post-breastfeed nasogastric feed requirement was grouped by total requirement (0-32%, 33-66%, 67-100%). Test weights were blinded to all but the researcher. The BAT determined whether the infant received full, half or no top-up. Data were pseudo-anonymised and analysed using SPSS v23.0 ($p < 0.05$ significance).

Results

30 infants were included with 54 test weights performed. The mean birth gestational age was 31+0 weeks (range 24-34 weeks). The mean birth weight was 1527g (605-2560g). 46.2% (25/54) test weights determined the infant had an inappropriate top-up using the BAT. Of those who received an inappropriate top-up, 88% (22/25) received a top-up suboptimal for their requirements.

Conclusion

This study demonstrates that almost 1 in 2 infants receive inappropriate top-ups based on the BAT tool alone. The vast majority received a top-up less than their overall requirement which impacts infant weight gain and may extend length of stay. The BAT alone was inaccurate in assessing the top-up requirement of the infant. A more effective clinical assessment tool needs to be developed for preterm infants.

PERINATAL OPTIMISATION FOR PRETERM BIRTHS LESS THAN 34 WEEKS AT OLOL,DROGHEDA

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Background

Perinatal optimisation involves the implementation of intervention bundles of care to reliably deliver evidence-based interventions in the antenatal, intrapartum and neonatal period to improve preterm outcomes. Our aim is to optimise care for preterm births less than 34 weeks, focusing on the key bundles of care.

Methodology

In February 2023, we formed a quality improvement project team.

Using Plan Do Study Act (PDSA) we implemented;

1. Antenatal counselling pathway
2. We created and implemented a perinatal checklist for preterm births less than 34 weeks gestation
3. Process change to ensure that the checklist was completed
4. Parental and staff surveys completed
5. Ongoing education.

We are collecting and comparing a range of pre- and post-implementation data.

Results

Preliminary analysis at 2 months demonstrate improvement in the following areas: 50% increase in antenatal counselling. Right place of birth increased from 85% to 100% and an increase in IAP from 57% to 100%.

No change was observed in caffeine administration (100%), magnesium sulphate (66%) blood glucose level at one hour of life > 2,6mmol (85%) as well as optimal temperature on admission (66%).

Decrease in figures were noted in the following: Optimal antenatal steroids 66% to 50%, optimal cord clamping from 75% to 50% as well buccal colostrum administration from 33% to 16%.

Discussion

Even though the findings are preliminary, the directional improvement shows promise across a range of patient, process, staff and financial outcomes. Improved communication has been achieved between all stakeholders. Adherence to the bundles of care, will improve survival and neurodevelopmental outcomes and help to reduce overall cost considering the lifetime cost of cerebral palsy.

Our future goal is a seamless pathway of patient centered care for babies and their families. This project is an interdisciplinary collaboration to implement best practice for a vulnerable patient cohort.

NEONATAL INTUBATION - A DISAPPEARING SKILL?

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Background

Neonatal tracheal intubation is a highly skilled procedure providing a secure airway for effective positive pressure ventilation but is commonly complicated by unsuccessful first attempts, adverse tracheal intubation associated events and severe oxygen desaturations.

Several changes to resuscitation and stabilisation guidance over the last decade has reduced the number of babies who need intubation.

There is evidence both from the UK and internationally that intubation success rates are low and falling with overall first attempt success rates of 40-53%, and 22-23% requiring three or more attempts.

Methodology

An audit was done to assess the intubation practice and adherence to the intubation protocol and guideline in the NICU. We compared our practice to the standards set by the British Association of Perinatal Medicine neonatal safety airway management framework. A retrospective chart review was conducted from April 2023 to December 2023. The inclusion criteria were all newborns that required intubation both in emergent and non- emergent settings and had to be born in OLOL. Data were collected via an excel spreadsheet.

Results

Twelve files were obtained which included two term babies and 10 preterm babies with an average gestation of 30+1 weeks and average weight of 1.49kg. There were 25 intubation indications with overall 50 intubations attempts. There was a 64% 1st attempt intubation success rate (> than international average). However, poor adherence to the intubation management protocol was noted, referral after 4th attempt to the anaesthetist (40%), use of pre intubation medication(24%) ,use of video laryngoscopy (60%) and intubation sticker for documentation (0%).

Conclusion

As poor adherence to the intubation protocol was noted, we recommend staff education, re-emphasizing the use of the intubation sticker to standardise documentation. We plan to introduce an intubation checklist and airway skills workshops for safe airway management.

NEONATE WITH DOWN SYNDROME – SEPSIS, LEUKAEMIA, OR NEITHER?

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Background: Transient abnormal myelopoiesis (TAM) is a rare, myeloproliferative disorder virtually unique to infants with Down syndrome (DS) and usually presents in the first days of life but sometimes before birth. Most cases resolve without treatment but 10-20% develop Myeloid Leukaemia (ML-DS) before age 4. It has a highly variable clinical presentation overlapping with other conditions, notably neonatal sepsis and congenital leukaemia.

Case Scenario: A 3-day-old girl with clinical features of DS presented with fever, jaundice, respiratory distress, and reduced feeding. Examination revealed massive hepatosplenomegaly. Her WCC was 103 x 10^9/L and blood smear showed a blast percentage of 20%. Investigations revealed a hepatopathy (CBR 212 umol/L; ALT 478 IU/L; AST 520 IU/L). Septic workup was negative and genetic analysis confirmed trisomy 21 and a *GATA1* gene mutation, confirming a diagnosis of TAM. As her WCC and clinical features failed to improve over 3 days, she was commenced on low-dose cytarabine of 0.5 mg/kg for 7 days. Her bloods normalised, she never developed significant neutropenia, and her hepatosplenomegaly receded over the following 6 weeks. She will be monitored 3-monthly for 2 years, and 6-monthly until 4 years of age, for signs of progression to ML-DS.

Discussion: Blood blasts of > 10% and clinical findings should raise suspicion of TAM. The presence of 3 high-risk features (WCC >100 x 10^9/L; CBR >83 umol/L and abnormal AST and ALT suggesting hepatopathy; massive hepatosplenomegaly causing respiratory/feeding compromise) places the patient at high risk for TAM-related mortality. As high-risk disease and chemotherapeutic treatment can cause significant complications, early and accurate identification is crucial. More research and standardisation are warranted.

Conclusion: This case scenario highlights the importance of having a high index of suspicion of TAM in patients with suspected/confirmed DS, presenting with results suspicious of sepsis/leukaemia. Blood smears are recommended in all neonates with DS given their predisposition to haematological abnormalities – importantly, TAM.

DEVELOPMENT OF SEPSIS INDUCED COAGULOPATHY IN LATE ONSET SEPSIS IN NEONATES IS ASSOCIATED WITH MORTALITY

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Aim: Previous studies have described sepsis induced coagulopathy in neonates but have not explicitly associated its development with clinical outcomes. We examined the clinical course of neonates with late onset sepsis who were simultaneously assessed for a coagulopathy.

Methods: Retrospective data from a tertiary level neonatal unit was collected from January 2018- December 2021 on all neonates who had both a blood culture for late onset sepsis and a conventional coagulation test performed. Sepsis induced Coagulopathy (SIC) was defined by modified International Society of Thrombosis and Haemostasis criteria with the neonatal sequential organ failure assessment replacing the adult sequential organ failure assessment score. A binomial logistic regression was performed examining the association between SIC and i) mortality and ii) Major bleeds defined as a grade III/IV Intraventricular haemorrhage, Pulmonary haemorrhage, non IVH intracranial bleed, and rectal or gastric bleeding that occurred after the diagnosis of sepsis/ septic episode. Gestational age was included as an independent variable to control for its effect on mortality and bleeding risk. Coefficents from both regressions were exponentiated to derive odds ratios and their confidence intervals.

Results: From 417 neonates in the examined epoch, 34 patients met inclusion criteria. 19 neonates had a diagnosis of sepsis induced coagulopathy based on modified international society of thrombosis and haemostasis criteria whilst 15 did not. Neonates who met an SIC diagnosis had a significant increase in their odds of death (OR 7.5 95%CI 1.36-17.23) without increase in major bleeding (OR 1.2 95% CI 0.23-7.23).

Conclusions: Development of sepsis induced coagulopathy in late onset neonatal sepsis is associated with an increased risk of death. Further studies examining this process may provide therapeutic avenues in the treatment of neonatal sepsis and aid prognostication.

ADHERENCE TO PRESCRIBING FOLIC ACID TO ALL DIRECT COOMS TEST (DCT) POSITIVE BABIES BY DOCTORS IN NEONATAL UNIT IN UMHL .

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Background:
Ensuring consistent prescription of folic acid to DCT-positive babies in the Neonatal unit is crucial for minimizing complications like active hemolysis and maintaining proper hemoglobin (Hb) reticulocyte (retics)levels. However, current practices seem consultant-dependent rather than strictly adhering to guidelines. Conducting an audit could reveal the impact of not prescribing folic acid on DCT-positive babies, emphasizing the need for adherence. This could ultimately reduce long-term complications and alleviate the patient burden on UHL and UMHL.

Methodology:
In a retrospective study conducted at the (UMHL) from August 1, 2021, to August 31, 2022, data was collected for all (DCT) positive babies meeting inclusion criteria in the blood clinic. The ILAB system was used to assess Hb and retics levels at various time points, while additional information on folic acid usage was obtained from clinical notes. Clinical clerks from UMHL and UHL aided in tracking records related to UHL admissions with complications. Data analysis was performed using SPSS.

Results:
In a sample of 62 audited patients, 26 lacked a complete set of recorded bloods for various reasons, such as DNA issues. However, all patients had some blood samples taken. The audit assessed whether appropriate interventions occurred based on declared standards. Out of the total, 93.5% (58/62) required intervention due to low Hb and/or high retics levels. For 14% (8/58) of these cases, it was unclear from source documentation whether the intervention occurred. Among those requiring intervention, 55% (32/58) received Folic Acid, demonstrating compliance. Notably, none of the 62 patients were admitted to UHL for blood transfusion.

Conclusion:
This audit concludes that significant number of DCT positive jaundice babies had hemolysis leading to low Hb /high retics at either 2,4 or 6 weeks. None of them required blood transfusion nor admission due to any complications later in the hospital but considering the significant hemolysis, we should prescribe folic acid to all DCT positive babies.

TIMING OF URINE TOXICOLOGY IN NEONATAL ABSTINENCE SYNDROME (NAS)

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Background:

Neonatal abstinence syndrome (NAS) occurs following prolonged in-utero exposure to medications[1].

Several biologic specimens can be used for testing neonatal exposure. Urine is the most commonly used specimen, due to rapidly available results, and the non-invasive nature of testing[2].

Depending on the timing of the last dose, type of drug used, and cumulative drug exposure in-utero, maternal drugs can be detected in the infant's urine for up to 2-4 days post-delivery.

We aimed to identify if urine toxicology samples were collected within the first 24 hours of life, in infants born with suspected NAS.

Methods:

A retrospective chart review was conducted – electronic charts were accessed of all infants born in The Rotunda Hospital with NAS, from January to December 2021. Descriptive statistics were used to analyse the data collected.

Results:

A total of 59 patients were included. 50.8% (30/59) had urine samples collected. Of these 43.3% were collected within the first 24 hours of life (13/30).

The average time taken from birth to ordering of urine toxicology specimen was 38 hours 49 minutes. The average time taken from a specimen being received in the laboratory to publishing a result was 89 hours 58 minutes.
Overall, the average time taken from the birth of an infant, to publishing a urine toxicology result was 138 hours 26 minutes

Conclusion:

Our study demonstrates suboptimal rates of urine collection in suspected NAS particularly within the first 24 hours of life. This is likely multifactorial, including high workload of clinical staff, parents missing urine collections, and staff education.

We identified a lag time of 90 hours, on average, between urine collections being received in the laboratory and publication of a result. Our samples are sent externally for evaluation. As the centre with the highest rate of NAS in Ireland, in house testing for urine toxicology should be considered.

HETEROGENEITY IN THE DIAGNOSIS AND TREATMENT OF NECROTISING ENTEROCOLITIS

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Introduction

Necrotizing enterocolitis (NEC) is one of the most common gastrointestinal emergencies affecting newborns, occurring in 2-5% of all premature infants, and nearly 10% of preterm infants with very low birth weight (VLBW <1500 grams).

The clinical presentation of NEC varies from subtle to severe, and its definition has evolved over time.

The VON criteria for NEC are based on clinical and radiographic features, with treatment typically involving the administration of broad-spectrum antibiotics for 10-14 days and withholding enteral feeds while providing parenteral nutrition. Analgesia is also recommended to alleviate pain associated with this inflammatory condition.

Objective

The aim of this audit was to assess adherence to VON criteria in diagnosing NEC in our practice and to evaluate whether our management of NEC aligns with current guideline recommendations.

Methods

We conducted a retrospective analysis of charts from patients diagnosed with NEC between 2018 and 2023. Demographic variables, clinical and radiographic criteria of NEC, analgesia, antibiotic treatment, and antibiotic duration were collected from the charts.

Results

During the study period, 62 infants were diagnosed with NEC. The median gestational age of our patient cohort was 26 weeks (Interquartile Range [IQR] ±3 days). NEC was typically diagnosed at a median postnatal age of 8 days, (IQR ±1.5 days). Among them, 70.5% met the VON criteria for NEC diagnosis. Of those, 90.5% received either metronidazole or meropenem as the antibiotic of choice, but only 47.4% of them received treatment for ≥10-14 days. Analgesia was prescribed in only 71.4% of patients diagnosed with NEC based on VON criteria.

Conclusions:

Our analysis revealed poor adherence to international guidelines for diagnosing NEC. Implementing a local guideline that aligns with international evidence is crucial to improving NEC management practices.