British association of perinatal medicine in conjunction with the neonatal society

Plenary

P01 IMPROVED GROWTH OF EXTREMELY AND VERY PRETERM BABIES: EVALUATION OF A QUALITY OF CARE INITIATIVE

I Levene, K McCormick. *Newborn Care Unit, John Radcliffe Hospital, Oxford University Hospitals NHS Trust, UK*

10.1136/archdischild-2020-rcpch.468

Aim Measure weight gain in preterm infants after introduction of a nutritional care bundle.

Methods 509 infants less than 32 weeks gestation were studied until discharge home from the tertiary unit or their local neonatal unit. Growth and feeding data were prospectively collected for 18 months before and after the intervention. The intervention consisted of increasing the urgency of parenteral nutrition, routine introduction of enteral feeds from the first day of life, standardised weight-based daily increments of enteral feeds, use of donor human milk until at least 34 weeks corrected gestation (if insufficient mothers' own milk) and routine fortification of human milk from 120 ml/kg/day.

Results After the intervention, growth velocity by discharge home increased by 1 g/kg/day to 12.7 ± 2.2 g/kg/day ($p < 0.00002$) and weight z score change reduced from -1.38 ± 0.77 to -1.16 ± 0.76 ($p = 0.005$). The largest effect was seen in infants discharged home from the tertiary unit (z score change from -1.35 ± 0.73 to -1.04 ± 0.77 , $p = 0.007$) and in those discharged home on exclusive human milk (z score change from -1.65 ± 0.8 to -1.20 ± 0.9 , $p = 0.006$, growth velocity from 10.8 ± 2.2 g/kg/day to 13.0 ± 2.8 g/kg/day, $p < 0.00001$). The significant differences in growth previously seen between infants discharged on exclusive human milk compared to any infant formula were eliminated.

Conclusion Introduction of a simple nutritional bundle was associated with improved weight gain, particularly in those fed exclusive human milk at discharge. In order to achieve international growth recommendations further intensification of macronutrient provision may be required.

Plenary

P04 CHILDHOOD MORBIDITIES AFTER NEONATAL ABSTINENCE SYNDROME: A SYSTEMATIC REVIEW AND META ANALYSIS

¹P Rees, ²P Stilwell, ³C Bolton, ⁴M Arkilloglu, ⁵B Carter, ⁶C Gale, ¹A Sutcliffe. ¹Population Policy and Practice, UCL Institute of Child Health, London, UK; ²General Paediatrics, University College London Hospital, London, UK; ³Department of Paediatrics, Whittington Health NHS Trust, London, UK; ⁴School Of Medicine, Acibadem University, Istanbul, Turkey; ⁵Department of Biostatistics and Health Informatics, Institute of Psychiatry, Psychology and Neuroscience, King's College London, London, UK; ⁶Section of Neonatal Medicine Department of Medicine, Imperial College London, London, UK

10.1136/archdischild-2020-rcpch.469

Background Neonatal abstinence syndrome (NAS) has garnered international attention by reaching epidemic

proportions in countries such as the USA. Given the surge in incidence, the potential impact of NAS on the developing infant's physiology, and the prevalence of adverse childhood experiences amongst this cohort, it is critical that we gain a handle on the future health and wellbeing of this population.

Methods We undertook a systematic review and meta-analysis exploring the association between NAS and adverse childhood outcomes. A search strategy was developed in Medline Ovid and adapted for other databases. An all-language search was conducted across 11 databases between January 1, 1975, and September 3, 2019. Observational studies of children between 28 days and 16 years of age, in whom a previous diagnosis of opiate-related NAS was documented, were included.

Of 5864 studies identified, 580 full-text articles were screened for eligibility, independently by three reviewers, and data from 14 studies were extracted. Data were pooled using a random-effects model and presented as crude and adjusted Odds Ratios (aOR) with accompanying 95% confidence intervals and I^2 statistics.

Results Fourteen studies were included, five of which were suitable for meta-analysis. This included 11,549 children with previous NAS and 1,463,846 children without previous NAS, aged 0–16 years. Studies were conducted in the USA ($n=7$), Australia ($n=4$), the UK ($n=2$), and Norway ($n=1$). There was a strong association between NAS and: subsequent child abuse (aOR 6.49 (4.46, 9.45, $I^2=52\%$)), injuries and poisoning (aOR 1.34 (1.21, 1.49, $I^2=0\%$)), and conduct disorders (aOR 1.72 (1.19, 2.48, $I^2=0\%$)). Studies consistently demonstrated increased incidence of strabismus and nystagmus after NAS. There was a weak association between NAS and speech and language impairment (crude OR 2.81 (1.82, 4.33, $I^2=26\%$)); as well as emotional and behavioural disorders (crude OR 4.29 (3.13, 5.88, $I^2=0\%$)).

Conclusion NAS was significantly associated with future child abuse, injuries and poisoning, certain mental health diagnoses, and visual impairment. This review does not suggest causation but highlights important associations requiring urgent further investigation and targeted intervention to positively impact the life course trajectories of this growing cohort of children.

G552 ASSESSMENT OF CONTINUOUS SIDE-STREAM END TIDAL CAPNOGRAPHY MONITORING ON THE NEONATAL INTENSIVE CARE UNIT

^{1,2}E Williams, ^{1,3}T Dassios, ^{1,2}A Greenough. ¹Women and Children's Health, Faculty of Life Sciences and Medicine, King's College London, London, UK; ²The Asthma UK Centre for Allergic Mechanisms in Asthma, King's College London, London, UK; ³Neonatal Intensive Care Unit, King's College Hospital NHS FT, London, UK

10.1136/archdischild-2020-rcpch.470

Background End tidal capnography (EtCO₂) provides a non-invasive form of continuous monitoring, but there have been concerns about its reliability on the neonatal unit. Our aim was to evaluate a novel side-stream capnograph device against gold standard mainstream capnography and in ventilated infants with differing respiratory disease severities.

Methods A prospective study of ventilated infants was undertaken. Simultaneous measurements of EtCO₂ were made using a gold standard mainstream capnograph and the newer side-

stream device (microstream capnography). The side-stream results were also compared to arterial or capillary CO₂ (PCO₂) results. Respiratory disease severity was classified according to the ratio of dead space to tidal volume (Vd/Vt), which was calculated using the modified Bohr's equation. Agreement between the results of the mainstream and side-stream device were assessed by Bland-Altman analysis with linear regression and Spearman's rank correlation used to evaluate the strength of relationships. Ethical approval was given by the London (Camden & King's Cross) Research Ethics Committee and parents gave informed written consent for their infants to take part in the study.

Results Fifty-four infants (28 male) were recruited with a median (IQR) gestational age of 31.6 (28.1–36.6) weeks and a birthweight of 1.43 (0.91–2.66) kg. There was a strong correlation between the results of the mainstream and side-stream devices ($r=0.93$; $p<0.001$). The mean constant bias between the two methods of EtCO₂ monitoring was -0.49 ± 0.43 kPa (95% agreement levels -1.33 to 0.36 kPa). Side stream EtCO₂ predicted PCO₂ better in infants with less severe lung disease ($Vd/Vt<0.35$, $r^2=0.72$; $p<0.001$) than in infants with more severe lung disease ($Vd/Vt>0.35$, $r^2=0.35$; $p=0.002$).

Conclusion Side-stream capnography performed similarly to the gold standard mainstream capnography. The relationship of EtCO₂ to arterial or capillary CO₂ levels diverged with increasing respiratory disease severity, likely as a result of a higher physiological dead space and greater ventilation perfusion mismatch.

G553

PREVALENCE AND PATTERN OF PRENATAL ALCOHOL EXPOSURE DETERMINED BY ALCOHOL BIOMARKERS IN NEWBORN BLOOD SPOT SCREENING CARDS

EMA Henderson, H Mactier, D Favretto, D Young. Princess Royal Maternity, NHS Greater Glasgow and Clyde, Glasgow, UK

10.1136/archdischild-2020-rcpch.471

Fetal alcohol spectrum disorder (FASD) is the commonest preventable cause of preventable neurodisability but is under-diagnosed. Earlier diagnosis helps prevent secondary effects of FASD, resulting in better educational attainment and earlier healthcare interventions. Maternal self-report of prenatal alcohol exposure (PAE) is negligible, despite 1 in 7 women in Scotland drinking alcohol in pregnancy, as determined by alcohol biomarkers in meconium (Abernethy et al). Phosphatidylethanol (PEth), a direct metabolite of ethanol can be measured from newborn dried blood spot cards. In adults, PEth is 100% specific for alcohol exposure in blood samples for up to 12 days after a single drink. Blood spots cards are collected from almost all infants in the UK on day five and stored; retrospective testing might be possible when FASD is suspected.

Objective To investigate the potential utility of newborn blood spot cards for the detection of PAE to determine prevalence.

Population Total population of infants delivering in a single maternity hospital on each fourth day (random sample).

Methods 840 mother and infant dyads were recruited over an 11-month period to provide meconium and blood spot samples. The latter were collected coincident with routine newborn screening, when the original heel prick bleeding allowed. Maternal and infant demographics were collected via a health questionnaire. Samples were frozen and analysed at the University of Padova. The study had REC approval; all mothers gave written informed consent.

Results Blood spot cards were collected from 510 infants; 502 (98.5%) were analysable for PEth. 216 (43.0%) samples were positive for PEth and in 148 (29.5%) the concentration was > 20 ng/ml, indicative in adults of significant alcohol exposure. In the recruited cohort, 13.8% of mothers admitted to alcohol consumption beyond 20 weeks of pregnancy, 14.5% of meconium samples were positive for ethylglucuronide and 39.6% positive for fatty acid esters.

Conclusions Analysis of newborn blood screening cards for PEth is feasible. There is a need for further data correlating PEth values in the newborn with other biomarkers. Cut off values used for adults may overestimate PAE.

G554

INTRA- AND INTER-OBSERVER VARIABILITY IN PDA SIZE MEASURED ON TRANSTHORACIC ECHOCARDIOGRAPHY (TTE) IN EXTREMELY PRETERM BABIES

K Babla, R Dumitru, D Duffy, J Richards, A Kulkarni. Neonatal Unit, St George's Hospital NHS FT, London, UK

10.1136/archdischild-2020-rcpch.472

Background The internal diameter of the patent ductus arteriosus (PDA) measured on transthoracic echocardiography (TTE) is commonly used in determining the need for treatment in clinical practice and enrolment in research trials. PDA size measured on TTE has not been well validated.

Objective To assess the intra- and inter-observer variability in PDA internal diameter measured on TTE on the same examination in babies born at ≤ 30 weeks' gestation admitted to St George's neonatal unit.

Methods We included 56 babies born ≤ 30 weeks' gestation that had a clinically indicated TTE. TTEs were performed by a single consultant neonatologist (AK) certified in echocardiography. PDAs were visualised using a high parasternal view, and cine-loops were stored on DICOM Radiology viewing software without measurement annotations.

PDAs were measured at the narrowest diameter on 2-Dimensional (2D) and Colour Doppler echocardiography

Abstract G554 Table 1

	Mean Difference	Max Difference	Min Difference	Bias	Upper Limit of Agreement	Lower Limit of Agreement	Repeatability Coefficient	Repeatability Index
2D	0.70	2.50	0.00	-0.04	1.67	-1.75	1.75	81%
Colour	0.96	2.50	0.00	-0.83	0.63	-2.30	1.49	62%