

G167(P) THE MULTI-DISCIPLINARY PAEDIATRIC TRACHEOSTOMY CLINIC

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Aims To present our experience of managing children with a tracheostomy in a Multi-Disciplinary Team clinic consisting of an ENT Consultant, Paediatric Respiratory Consultant, a Nurse Specialist and Speech and Language Therapist.

Methods Retrospective case note review of all children seen in the Multi-Disciplinary Team Tracheostomy clinic between February 2009 and May 2011. Data analysed to determine the current underlying indication for tracheostomy and the number of tracheostomy related issues managed per clinical episode.

Results The MDT Tracheostomy clinic began in February 2009 and is held once a month. 44 different patients have been seen in 81 outpatient episodes between February 2009 and May 2011. In our series the three most common indications for tracheostomy were; underlying neurodevelopmental problems (61.3%, $n = 27$), most commonly cerebral palsy (43.2%, $n = 9$), lower airway problems (59%, $n = 26$) and upper airway obstruction (including subglottic stenosis, $n = 7$) (59%, $n = 26$). 15 patients were on ventilators with a further 6 patients who had had previously been on long term ventilation. The median number of tracheostomy related issues dealt with each appointment was 1 (range 0 – 4). Secretions were the most common problem (51.7% of visits). 40% ($n = 6$) patients on a ventilator had ventilator issues reviewed. 14 patients had a speaking valve already and 10 were considered for a trial of a speaking valve.

Conclusions Children with a tracheostomy are a diverse group of patients. The most common indications for paediatric tracheostomy have changed in the last 50 years from infective causes to airway obstruction and anomalies, long-term ventilation requirement and underlying neuromuscular or respiratory problems. Our approach to managing this diverse group of patients involves a Multi-Disciplinary Team consisting of a Paediatric Otolaryngology Consultant, a Paediatric Respiratory Physician and a Tracheostomy Nurse Specialist or Speech and Language Therapist (SALT). The unified approach also empowers the carers and patient as a home management plan, long-term plan and goals are generated at the end of each appointment.

G168(P) A REVIEW OF THE EFFECTIVENESS OF HEATED, HUMIDIFIED HIGH FLOW NASAL CANNULA THERAPY (HHHFNC) FOR PATIENTS WITH BRONCHIOLITIS

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Introduction HHHFNC therapy is a modality of non-invasive ventilation which provides humidified, warm, high flow oxygen (>2 litres per minute). It has been proposed as an alternative to CPAP in maintaining children without the need for intubation and mechanical ventilation. We document results of HHHFNC therapy on children with bronchiolitis in our big DGH.

Aim To review the effectiveness of HHHFNC therapy for patients with bronchiolitis.

Method A retrospective study analysing records of 27 paediatric patients treated with HHHFNC therapy who presented with bronchiolitis between September 2010 – March 2011. Diagnosis of bronchiolitis was made clinically, with the aid of nasopharyngeal aspirates. Measured variables were clinical state and capillary

blood gas changes; pre and 12 hours on HHHFNC. CPAP was never used on these children. Data was of normal distribution hence paired t-test was used to determine statistical significance with SPSS software.

Results 27 patients (female- 14; male- 13; mean age- 2.4 months). Single or dual bronchiolitis viruses were detected in NPA samples in addition to a H1N1 strain in 3 patients.

Mean admission was 6 days with a mean duration on HHHFNC of 3.1 days and a median of 2 days. There was a mean reduction in respiratory rate count of 8.3; mean reduction in heart rate of 23.7 and pH values improved by a mean of 0.6 (CI 99% 0.7). 65% patients changed from intravenous fluids or nasogastric feeds to oral by 24 hours.

The paired t-test analyses demonstrated statistical significance for changes in values for interval of difference of pH (p value –0.016), respiration rate (p value-0.001) and heart rate (p value –0.00).

Conclusion Findings showed subjective and objective improvement in the patients' physical variables and blood gas analyses. There are huge potentials to cost savings and clinical effectiveness with HHHFNC therapy, as there was only one transfer to paediatric intensive care unit amongst these patients. Following the conclusions drawn from this data, a further prospective study aim would be to demonstrate whether HHHFNC has superiority or non-inferiority to CPAP therapy.

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G169 PREVENTING EARLY POSTNATAL HEAD GROWTH FAILURE IN VERY PRETERM INFANTS: THE RANDOMISED CONTROLLED SCAMP NUTRITION STUDY

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Background Postnatal head growth failure is well recognised in very preterm infants (VPI), the largest deficit occurs at 3–4 weeks followed by some catch-up growth until 36 weeks corrected gestational age (36wCGA). Head circumference (HC) is correlated with brain volume and later neurodevelopmental outcome. Early nutritional deficits commonly occur in parenteral nutrition (PN) dependent VPI. We hypothesised that a Standardised, Concentrated with Added Macronutrients Parenteral (SCAMP) nutrition regimen would improve early head growth.

Aim To compare the change in HC (Δ HC) and standard deviation score (Δ SDS) achieved at day 28 in VPI randomised to receive SCAMP nutrition (12% glucose, 3.8g/kg/day protein/lipid) or a control standardised, concentrated PN regimen (10% glucose, 2.8g/kg/day protein/lipid).

Methods The double-blind study (ISRCTN: 76597892) received ethical approval. Control PN was started within 6 hours of birth. Following parental consent, VPI (<1200g; <29 weeks) were randomised (day 2–5) to either start SCAMP or remain on the control regimen. HC was measured at randomisation, day 7 and then weekly until 36wCGA. Actual daily nutritional intake, biochemical and metabolic data were collected for day 1–28. Weekly growth data and major preterm complications were collected until 36wCGA.

Results 150/196 eligible infants were randomised at mean age 73.5 hours. Mean (SD) birthweight (g) and gestation (weeks) was: 900(158) versus 884(183) and 26.8(1.3) versus 26.6(1.4) in SCAMP ($n = 74$) and control ($n = 76$) groups respectively. SCAMP achieved higher mean actual protein/energy intakes (calculated weekly) with largest difference occurring in week 2: 25.5g/kg versus 20.9g/kg and; 762kcal/kg versus 664kcal/kg.

Abstract G169 Table 1 Primary outcome (mean/SD; 28-day survivors)

| Age | SCAMP HC (n = 66) | SCAMP SDS (n = 66) | Control HC (n = 69) | Control SDS (n = 69) | P value |
|----------------------------------|----------------------|-----------------------|------------------------|-------------------------|---------|
| Randomisation | 240mm (12) | -1.55 (0.73) | 240mm (13) | -1.48 (0.68) | |
| Δ HC/ Δ SDS Day 28 | 31mm (9) | +0.05 (0.66) | 26mm (8) | -0.32(0.65) | <0.001 |

Differences in Δ HC are already apparent at day 7 ($p < 0.05$) with the greatest difference at 3–4 weeks (28-day- Δ HC difference equates to 6% difference head/brain volume). Group HC differences are still apparent at 36wCGA ($p < 0.05$).

Conclusion Early postnatal head growth failure in VPI can be prevented by optimising PN.

G170 RANDOMISED CONTROLLED TRIAL OF SYNCHRONISED INTERMITTENT POSITIVE AIRWAY PRESSURE (SiPAP™) VERSUS CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) AS A PRIMARY MODE OF RESPIRATORY SUPPORT IN PRETERM INFANTS WITH RESPIRATORY DISTRESS SYNDROME

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Background Minimising exposure to factors contributing to chronic respiratory morbidity is a priority in preterm care. CPAP is established but alternatives are gaining popularity despite limited evaluation. SiPAP has not previously been compared to CPAP for first-line treatment of RDS.

Aims To compare SiPAP with CPAP as a primary mode of non-invasive respiratory support in premature infants with RDS.

Methods In this prospective two-centre trial, infants (GA 28⁺ to 31⁺; inborn; <6hrs old; no prior intubation; no major congenital disorders) were assigned to either SiPAP (BiPhasic Tr[®]) or CPAP delivered by the Infant Flow[®] SiPAP™ device. Randomisation was stratified by centre and gestation. Crossover or use of other devices was not permitted.

The primary outcome was a pre-defined failure of non-invasive respiratory support, necessitating intubation and ventilation, in the first 72 hours of treatment. Strategies for initial settings, weaning, discontinuation and deterioration were specified. To detect a 50% reduction in failure (power 80%, $\alpha = 0.05$, 2 tailed), 116 participants were required. Analyses were by intention-to-treat.

Results We assessed 368 infants at admission and recruited 120 of 149 eligible (CPAP 60, SiPAP 60). Baseline characteristics were comparable.

Abstract G170 Table 1

| Characteristic | CPAP | SiPAP | P value |
|---------------------------------------|------------|------------|---------|
| Gestational age, mean (SD) | 29.7 (1.2) | 29.8 (1.1) | 0.64 |
| Birthweight, mean (SD) | 1325 (335) | 1324 (300) | 0.99 |
| Male gender, n(%) | 34 (56.7) | 36 (60) | 0.71 |
| Singleton pregnancy, n(%) | 37 (61.7) | 39 (65.0) | 0.71 |
| Antenatal Corticosteroids (any), n(%) | 59 (98.3) | 59 (98.3) | 1.0 |
| Chorioamnionitis, n(%) | 9.0 (15.0) | 11 (18.3) | 0.62 |
| CRIB 2, mean (SD) | 4.3 (2.4) | 4.8 (2.3) | 0.31 |

Failure of non-invasive respiratory support, did not differ by allocated mode of respiratory support but occurred more frequently in the lower gestational age stratum (GA < 30⁺) ($p = 0.004$). Despite differing frequencies for some key morbidities there were no significant differences in secondary outcomes.

Abstract G170 Table 2

| Outcome | CPAP (n,%) | SiPAP (n,%) | P value |
|-----------------|------------|-------------|---------|
| Primary outcome | 7 (11.7) | 8 (13.3) | 0.78 |
| Death | 2 (3.3) | 0 (-) | 0.50 |
| Pneumothorax | 0 (-) | 4 (6.7) | 0.12 |
| BPD | 7 (11.9) | 5 (8.3) | 0.52 |
| NEC | 5 (8.3) | 1 (1.7) | 0.21 |

Conclusions For the very preterm infant, using SiPAP for first-line treatment of RDS does not confer any benefit in short-term respiratory outcome as compared to CPAP. Preterm morbidities and complications of non-invasive respiratory support were similar irrespective of allocation in this study.

G171 SURVIVAL OF PRETERM INFANTS ADMITTED TO NEONATAL CARE IN ENGLAND: A POPULATION-BASED STUDY USING NHS ELECTRONIC CLINICAL RECORDS

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Aims The survival of preterm infants is a matter of wide public interest. Survival prediction is important for clinicians when advising parents and for risk adjustment when comparing providers. Prediction models are generally based on historical data, often from hospital rather than population-based cohorts. Here we demonstrate the use of near-contemporaneous electronic National Health Service (NHS) clinical data to provide a practical, up-to-date, web-based survival prediction tool for preterm infants admitted to neonatal units in England. We compared this with existing UK and US predictors and evaluated the change in survival over recent years for extremely preterm babies from 22⁺–25⁺ week gestational age (GA) admitted to neonatal care, in comparison with previous published data.

Methods Data for infants born ≤ 31 ⁺ weeks GA that died or were discharged in 2009–2011 were received with Caldicott Guardian permission from English neonatal units in the UK Neonatal Collaborative. A multivariable logistic regression model was developed using known predictors. Discrimination and calibration were evaluated internally and on independent data. A web-based tool was written in Javascript. Survival was compared against data from the EPICure 2 study in 2006.

Results There were 17,491 infants included in the cohort, of whom 16,164 (92%) survived. Birth weight, GA, sex, antenatal steroids, and multiple birth were factors included in the final model. The interactive tool is available online for open access. The model showed good discrimination internally (area under ROC curve (AUC) = 0.89, 95% CI 0.88 to 0.90) and on independent data (AUC = 0.87, 95% CI 0.82 to 0.91). Predictive performance was similar to previous UK models and improved over a US model. There has been no statistically significant increase in survival to discharge of admitted infants born at 22⁺–25⁺ weeks gestation in England since 2006 (Relative Risk 1.10, 95% CI 0.98 to 1.22, $p = 0.11$).

Conclusions We have established the feasibility of employing contemporaneous, population-based, routinely collected, electronic NHS data for survival modelling for preterm babies admitted to neonatal care. The model is available in a web tool readily accessible to clinicians, parents, and healthcare managers and can be regularly updated to readily assess population changes in neonatal survival.