

[n=3]; IV [n=3]; mixed III/IV and V [n=2]) and one patient had pure membranous LN. All children except two developed nephritic-nephrotic syndrome and AKI, and acute dialysis was initiated in 2 patients with TMA. At presentation, patients with renal vascular lesions had a significantly lower median eGFR (21.0, IQR 14.0–51.0 versus 88, IQR 48.5–107.5 ml/1.73 m<sup>2</sup>/min; p=0.011) but similar degree of proteinuria (3.1, IQR 2.4–8.04 versus 2.5, IQR 1.3–5.1 mg/mg) than those without such lesions.

Treatments were heterogeneous due to variable disease severity. In addition to pulse methylprednisolone, 6 and 3 patients received induction therapies with intravenous cyclophosphamide and mycophenolate mofetil, respectively. Three patients with severe AKI (LV n=2; TMA n=1; mean GFR 18.6 ml/1.73 m<sup>2</sup>/min) responded to rituximab as add-on rescue therapies and eventually did not require acute dialysis. Therapeutic plasma exchange was performed in three patients with TMA as adjunctive therapies. Following induction, 6 patients attained complete remission and had normal GFR and no proteinuria at last follow-up. Three patients failed to respond and developed chronic kidney disease (CKD). One LV patient had poor adherence and repeated relapses leading to end stage kidney disease (ESKD) and received a kidney transplant. One patient with TMA and another with LV developed CKD II (GFR 74 ml/1.73 m<sup>2</sup>/min) and CKD IV (28 ml/1.73 m<sup>2</sup>/min), respectively. At the end of the study, more children with LN and renal vascular lesions developed either CKD or ESKD (3/6 [33.3%] versus 4/48 [7.7%], p=0.06), although it did not reach statistical significance.

**Conclusions** Childhood-onset LN with renal vascular lesions had more severe presentation and may be associated with worse kidney outcomes. Identifying these lesions may have prognostic value and guide clinical management. Further large-scale studies are required to define its role in the future LN classification.

307

### WEANING OFF INCUBATOR HUMIDIFICATION IN THE NEONATAL INTENSIVE CARE UNIT (NICU)- AN EVIDENCE UTILIZATION PROJECT

Xia Wang, Soke Yee Lee, Tomomi Ogura, Sarasvati Rajoo. *Singapore*

10.1136/bmjpo-2021-RCPC.170

**Background** Infants born less than 32 weeks of gestation age are nursed in closed humidified incubator to minimise trans-epidermal water loss, prevent electrolytes imbalances and improve thermoregulation. The practice in the unit is these infants are cared for in closed incubators with 85% humidity for first 7 days of life, then from the second week onwards, gradually reducing the incubator humidity to 70%, and from the fourth week, further decrease the humidity to 65%. These infants are nursed in incubator with 65% humidity till they reached body weight of 1.7 kg. The estimated length of stay in the humidified incubator for these infants is 1.5 – 3 months. However, high or prolonged humidified environment is associate with *Candida albicans*, which has a reported mortality rate of 21–32% in very low birth weight infants. In 2015, two infants nursing in humidified incubator were detected having skin *Candida albicans* infection.

**Objectives** To minimise skin candida infection in infants requiring closed humidified incubator based on best available evidence.

**Methods** The length of stay in the humidified incubator and humidity setting were reviewed. In the new guideline, infant less than 32 weeks of gestation age is nursed in close incubator with humidity of 85% for the first 5 days of life. From the 6th day onwards, to decrease incubator humidity by 5% daily, till it reaches the targeted discontinue setting of 60%, which is 11 days of life. Five briefing sessions were conducted to all staff. Table of incubator humidity setting schedule are pasted in all incubators for easy reference. Staff compliance to new guideline was monitored daily. Project evaluation was by audits in April 2015 to June 2016.

**Results** The post-implementation and follow-up audit showed a 100% staff compliance. No candida infection was detected. The project has reduced the length of infant requiring humidified incubator to 10 days, which saved about SGD\$193.20 per infant per hospitalisation.

There were 244 infants (Year 2017: 52 infants, Year 2018: 68 infants, Year 2019: 59 infants, Year 2020: 65 infants) in total who were born less than 32 weeks of gestation age since project implementation to end of 2020. Further data showed there is no candida infection detected among these infants.

**Conclusions** The project provides clear humidity percentage guidelines for nurses to follow, and successfully achieved zero skin *Candida* infection on infants who are being nursed in closed incubator. The project provides clear humidity setting guidelines for nurses, and successfully achieved zero skin candida infection for infants who require close incubator.

311

### KNOTTED PERIPHERALLY INSERTED CENTRAL CATHETER IN A NEONATE

Paula Tang, Yvonne Leung, Nicholas Chao, Michael Leung, Zita Hung, Kevin Fung. *Hong Kong*

10.1136/bmjpo-2021-RCPC.171

**Background** With the advance in technology and medical expertise, it has been increasingly common for clinicians to establish a secured vascular access in the hospitalized neonates. As the veins in preterm neonates are notoriously difficult to catheterize, clinicians are often left with limited options when a secured vascular access is clinically indicated for medications, fluids or intravenous nutrition.

**Objectives** Peripherally inserted central catheter (PICC) has the advantage of being easily available in most SCBU and NICU, does not require the input of anaesthetist or radiologist and they are often quite durable, lasting up to 3 to 4 weeks in a neonate with meticulous flushing and nursing care. While blood stream related infection, clot formation, malposition, occlusion and extravasation are commonly quoted PICC related complications in the literature, we report a case of tight knot formation of PICC during insertion in a neonate, subsequently requiring venotomy for retrieval.

**Methods** We report a case of a pre-term neonate with difficult PICC insertion and retrieval. Tight complex knotting of the PICC was confirmed by XRay, and the catheter was

subsequently retrieved via cut down method in an emergency operation.

**Results** A 28-week-gestational age male infant presented with intestinal perforation requiring emergency laparotomy and ileostomy formation. At 3 months of age (corrected age 40 weeks), he required intravenous nutrition due to high output stoma and suboptimal weight gain. Insertion of a vygon Premicath 1French catheter via the left cephalic vein at the forearm was attempted. X ray showed complex coiling of the catheter within the vein (figure 1), therefore it was decided to remove the catheter at the bedside, however, resistance was encountered when withdrawing the catheter. Xray confirmed knotting of the catheter at about 6 cm away from the percutaneous puncture site (figure 2).

Emergency operation under general anesthesia was arranged, and venotomy was made directly over the knot after controlling the left cephalic vein. The catheter was retrieved and the cephalic vein was ligated afterwards. Post op recovery was uneventful. Subsequently a tunneled central catheter (Broviac catheter) was inserted at an elective operation into the right internal jugular vein

**Conclusions** PICC have been used extensively in children where vascular access can often be challenging for medium term infusion therapy. These are non-tunneled vascular devices that can be inserted at the bedside (1). Knot formation during PICC insertion in a 5-month old infant had been reported (2) and the author suggested a trial of knot dissolution by repeated flushing with saline solution. Another paper suggested using 0.008' hydrophilic guidewire to unloop the PICC knot, however it was not actually performed as the case described did not have any real knot (3). Our case illustrated the potential complication of PICC insertion in a small neonate.

312

#### MORTALITY TRENDS OF ONCOLOGY & HEMATOPOIETIC STEM CELL TRANSPLANT PATIENTS SUPPORTED ON EXTRACORPOREAL MEMBRANE OXYGENATION: A SYSTEMATIC REVIEW & META-ANALYSIS

RR Pravin, Benjamin Xiongzhen Huang. *Singapore*

10.1136/bmjpo-2021-RCPCH.172

**Background** There is an increasing frequency of oncology and hematopoietic stem cell transplant (HSCT) patients seen in the intensive care unit and requiring extracorporeal membrane oxygenation (ECMO), however, prognosis of this population over time is unclear. This study aims to determine the mortality trends and complication rate in oncology and HSCT patients receiving ECMO by conducting a systematic review and meta-analysis.

**Objectives** The main outcome was all-cause mortality and studies reporting mortality within any timeframe (e.g. survival to decannulation, ICU, hospital, 28-, 60- and 90-day mortality, etc.) were included. However, hospital mortality was the most clinically relevant and was used as the primary outcome in the analyses. Secondary outcomes included bleeding, mechanical, cardiovascular, pulmonary, neurological and renal complications on ECMO, defined by the ELSO registry database definitions, and duration of ECMO, mechanical ventilation (MV) and ICU stay.

**Methods** MEDLINE, EMBASE, Cochrane and Web of Science were searched from earliest publication until April 10, 2020

for studies to determine the mortality trend over time in oncology and HSCT patients requiring ECMO. Primary outcome was hospital mortality. Random-effects meta-analysis model was used to obtain pooled estimates of mortality and 95% confidence intervals. A *priori* subgroup metanalysis compared adult versus pediatric, oncology versus HSCT, hematological malignancy versus solid tumor, allogeneic versus autologous HSCT, and veno-arterial versus veno-venous ECMO populations. Multivariable meta-regression was also performed for hospital mortality to account for year of study and HSCT population.

**Results** 17 eligible observational studies (n=1109 patients) were included. Overall pooled hospital mortality was 72% (95% CI: 65, 78). In the subgroup analysis, only HSCT was associated with a higher hospital mortality compared to oncology subgroup [84% (95% CI: 70, 93) vs. 66% (95% CI: 56, 74); p=0.021]. Meta-regression showed that HSCT was associated with increased mortality [adjusted odds ratio (aOR) 3.84 (95% CI 1.77, 8.31)] but a later year of study was associated with decreased mortality [adjusted odds ratio (aOR) 0.92 (95% CI: 0.85, 0.99)].

**Conclusions** This study reports a high overall hospital mortality in oncology and HSCT patients on ECMO which improved over time. The presence of HSCT portends almost a fourfold increased risk of mortality and this finding may need to be taken into consideration during patient selection for ECMO.

314

#### DISPARITY BETWEEN DIFFERENT REFERENCE VALUES FOR HYPERTENSION AMONG CHILDREN AND ADOLESCENTS TREATED FOR ADHD: EXPERIENCE FROM A NORTH WEST ENGLAND CCH CLINIC

Michael Ogundele, Cornelius Ani. *UK*

10.1136/bmjpo-2021-RCPCH.173

**Background** ADHD affects 5% of children and young people (CYP) and, if untreated, can be associated with significant multi-domain impairments. Medications licensed for ADHD treatment are effective but can be associated with side effects. Stimulant medications (Methylphenidate and Dexamfetamine/Lisdexamfetamine) and Atomoxetine are associated with small but statistically significant increases in Blood Pressure (BP) and Pulse. Intuniv is an alpha 2a agonist, which can be associated with low BP and bradycardia. Thus, guidelines recommend regular monitoring of BP and Pulse and plotting the figures on reference centile charts. However, confusion can arise about which reference centiles to use due to differences in the cut-offs applied in different regions of the world. Both the American Academy of Pediatrics (AAP) and European Society of Hypertension (ESH) define hypertension (HT) in CYP as BP  $\geq$ 95th percentile for gender, age and height on three or more separate occasions, while pre-hypertension (PreHT) (now redefined as elevated BP) is BP  $\geq$ 90th percentile but less 95th percentile. However, the British reference for CYP between 4 and 23 years defined HT as BP above the 98th percentile for age, and 'high-normal BP' (PreHT) between the 91st and 98th percentile.

**Objectives** This audit aimed to describe the BP profile of a sample of otherwise healthy CYP on medications for ADHD attending routine clinical reviews, and to compare the