

Results Altogether 62 patients with 63 episodes of admission were included for the analysis. Of these, 58.7% were male and the median (25th, 75th percentile) age was 6.1 (1.6, 12.7) years old. 49.2% of patients had a diagnosis of malignancy, 9.5% of them received bone marrow transplantation and 31.7% of patients were admitted post-operation. The overall incidence of AKI during PICU stay was 55.6% using either the creatinine-based or urine output-based criteria (stage 1: 20.6%, stage 2: 15.9% and stage 3: 19.0%). Most patients experienced AKI on Day 1 of PICU admission using the creatine-based criteria (figure 1). Children with AKI had more types of electrolytes disturbances (5 types vs 3 types, $p < 0.01$). Urine output and fluid overload on Day 1 of PICU admission were not significantly different between those with and without AKI. Risk factors for developing AKI during PICU admission included recipient of bone marrow transplantation (relative risk [RR with 95% confidence interval]: 1.58 [1.03, 2.44]), requirement of inotropic support (RR: 1.74 [1.17, 2.59]) and non-invasive ventilation (RR: 1.76 [1.22, 2.55]), and a higher number of nephrotoxic medication exposure (RR: 1.20 [1.04, 1.38]) (table 1). 6.3% of patients required continuous renal replacement therapy. The overall mortality was 4.8%. Patients with AKI had a longer PICU length of stay (4 vs 3 days, $p = 0.004$) and hospitalization duration (23 vs 11 days, $p = 0.036$) and a lower estimated glomerular filtration rate (eGFR) upon PICU discharge (136.1 vs 174.1 ml/min/1.73 m², $p = 0.012$). Altogether 7.9% of patient were discharged from PICU with impaired renal function and 3.2% of them were dialysis-dependent.

Conclusions AKI was commonly encountered among critically ill children. History of bone marrow transplantation, requirement of inotropic and non-invasive ventilatory support, and higher number of nephrotoxic medications were risk factors for AKI development. Those who had AKI were associated with a higher mortality, longer PICU and hospital stay and a lower eGFR on PICU discharge. A significant proportion of children with AKI were discharged with impaired renal function that warranted a long-term follow-up.

416

ELECTROLYTES AND ACID-BASE DISTURBANCES: THE IMPACT AND RELATIONSHIPS WITH TUBULAR DYSFUNCTION AMONG CRITICALLY ILL CHILDREN

Wun Fung Hui, Kam Lun Hon. *Hong Kong*

10.1136/bmjpo-2021-RCPC.233

Background Electrolytes and acid-base disturbances are common yet largely ignored problems in critical care. Although closely related, the relationship between electrolytes disturbance and acute kidney injury (AKI) has not been extensively studied among critically children.

Objectives We presented the results of the interim analysis of an ongoing prospective cohort study on the epidemiology of acute kidney injury and electrolytes disturbances (E-AKI-Drug Study) in a newly established paediatric intensive care unit (PICU).

Methods All children aged 1 month to 18 years old admitted to the PICU of our hospital after June 2020 would be enrolled. Those with pre-existing chronic kidney disease, impaired renal function for ≥ 3 months, immediate post-renal transplant and short stay in PICU < 1 day with no blood

taking would be excluded. Appropriate urinary investigations would be carried out if there were electrolytes disturbances. For children with more than two types of electrolytes disturbances, urine beta-2-microglobulin and amino acid profile would also be determined. AKI was defined using the KDIGO criteria. The results of the initial 4 months of data collected would be presented.

Results Altogether 63 episodes of admission were included for the interim analysis. 58.7% of the subjects were male and the median (25th, 75th percentile) age was 6.1 (1.6, 12.7) years old. 49.2% of patients had a diagnosis of malignancy and 9.5% received bone marrow transplantation. The overall incidence of AKI during PICU stay was 55.6%. The median number of types of electrolyte disturbance was 4 (2, 5) types. Hypophosphataemia (85.5%), hypocalcaemia (77.4%) and hypokalaemia (61.3%) were the three most common types of electrolytes disturbances respectively. The incidence of metabolic acidosis and alkalosis were 90.3% and 35.5% respectively. Urinary wasting of potassium, phosphate and magnesium were common among children with hypokalaemia, hypophosphataemia and hypomagnesaemia, occurring in 25%, 50% and 87.5% of the respective children (figure 1). Among children with more than two types of electrolytes disturbances, abnormal urinary beta-2-microglobulin level occurred in 64.7% of patient (median level 0.9 [0.2, 5.2] $\mu\text{g/ml}$). The median degree of aminoaciduria was 23.1 (9.5, 47.6)%. Children requiring inotropic (5.0 vs 3.0 types $p < 0.01$) and ventilatory support (5.5 vs 4.0 types, $p = 0.008$) and children with AKI (5.0 vs 3.0 types, $p < 0.01$) had higher number of electrolytes disturbances. Besides, children with AKI had more hypernatraemia (35.3% vs 10.7%, $p = 0.036$) and hypokalaemia (73.5% vs 46.4%, $p = 0.029$). Those with stage 3 AKI also had highest proportion of hyperphosphataemia compared to those with less severe or no AKI ($p = 0.002$). The number of types of electrolytes disturbances was associated with longer duration of ventilation ($r = 0.613$, $p = 0.011$) and PICU length of stay ($r = 0.567$, $p < 0.001$), as well as increased risk of PICU mortality (relative risk 4.3 [95% confidence interval 1.4, 12.7]).

Conclusions Electrolytes and acid-base disturbances were commonly encountered among critically ill children. Urinary wasting of the electrolytes and proximal tubular dysfunction were commonly observed among children with multiple electrolytes disturbances. The degree of electrolytes disturbances would contribute to longer ventilator days, PICU stay and even mortality, indicating a need to address the tubular health and its impact in critically ill children.

417

THE APPLICATION OF EXTRACORPOREAL BLOOD PURIFICATION (EBP) IN CRITICALLY ILL CHILDREN

Wun Fung Hui, Kam Lun Hon. *Hong Kong*

10.1136/bmjpo-2021-RCPC.234

Background EBP has been increasingly used to treat various conditions among critically ill patients and is frequently incorporated into the continuous renal replacement therapy (CRRT) circuit.

Objectives We reported our experience of applying EBP in a newly established Paediatric Intensive Care Unit

Methods The medical records of children requiring EBP in our hospital between 3/2019 to 1/2021 were reviewed

Abstract 417 Table 1

Variable	Patient 1	Patient 2	Patient 3	Patient 4
Clinical features				
Age (year)	17.1	15.4	8.5	14.4
Sex	Female	Male	Male	Female
Indication	Lactic acidosis	Sepsis/Cytokines storm	Hyperbilirubinaemia	Rhabdomyolysis
PIM3 predicted mortality (%)	6.2	31.4	5.9	17.1
Pre-therapy eGFR (ml/min/1.73 m ²)	210.2	133.8	45.6	
Need for mechanical ventilation	No	Yes	No	Yes
Need for inotropes	No	Yes	No	Yes
EBP/CRRT parameters				
Technique	High volume haemodiafiltration	Haemoperfusion	Single-pass albumin dialysis	Haemoperfusion
Prior conventional CRRT	No	No	Yes	Yes
Filter	ST100	Oxiris	ST100	Cytosorb
Mean blood flow rate (ml/kg/min)	4.7	4.1	3.7	
Mean replacement rate (ml/kg/hour)	21.4	32.5	23.0	
Mean dialysate rate (ml/kg/hour)	72.7	32.2	30.3	
Anti-coagulation	Heparin	Nil	Nil	Heparin
Treatment duration (hour)	160.9	37.0	42.1	8.0

Results Altogether four patients were identified during the period (table 1). No major CRRT-specific complication was encountered except mild electrolytes disturbances.

Patient 1: A 17-year-old girl received high-volume haemodiafiltration as a bridging therapy for her refractory type B lactic acidosis related to the relapse of B-cell acute lymphoblastic leukaemia (ALL). She had a peak lactate level of 18 mmol/L with lowest pH 7.13 and bicarbonate level 6.0 mmol/L. The measured mean lactate clearance was 65 ml/kg/hour.

Patient 2: A 15-year-old male with T-cell ALL had peritonitis and pneumoperitoneum complicated with Klebsiella pneumoniae septicaemia. He required high dose inotropes despite anti-microbials and intravenous immunoglobulin. Two sessions of haemoperfusion using the Oxiris[®] filter were then performed for endotoxin removal. The inotropes were successfully weaned off afterwards. Resection of the remaining necrotic small bowel was performed 3 days later.

Patient 3: An 8-year-old boy with bone marrow transplantation gradually developed conjugated hyperbilirubinaemia due to acute veno-occlusive disease and graft-versus-host disease. He received a session of single-pass albumin dialysis using 4% albumin as dialysate to reduce his bilirubin level, bridging him to receive a liver biopsy that confirmed his diagnosis. The total bilirubin level decreased from 305 to 222 µmol/L after the therapy.

Patient 4: A 14-year-old girl with undiagnosed anaplastic large cell lymphoma was admitted for refractory shock that deteriorated rapidly causing multi-organ failure. She was then started on veno-arterial extracorporeal membrane oxygenation but was complicated with reperfusion injury causing rhabdomyolysis with a peak creatine kinase (CK) level up to 264500 IU/L. Myoglobin clearance using the absorbent Cytosorb[®] was then added to the CRRT. Her CK level was successfully brought down to 97436 IU/ml after 8 hours of therapy. However, she did not respond to the chemotherapy and finally succumbed 5 days after admission.

Conclusions EBP using different techniques and filters can be safely applied in selected children as an adjunctive therapy for

various conditions. However, the optimal dose, timing of initiation and monitoring target remain largely unanswered.

419

A REVIEW ON PAEDIATRIC PALLIATIVE CARE PROGRAM IN A REGIONAL HOSPITAL IN HONG KONG

Tracy Yuen Han Lee, Sze Sun Man, Choi Ha Kwong, Chak Ho Li. *Hong Kong*

10.1136/bmjpo-2021-RCPCH.235

Background Paediatric palliative care (PPC) focuses on the enhancement of quality of life for children with life-limiting diseases and support to their families. This study reviewed the paediatric palliative care program in Hong Kong (HK).

Objectives Reviewed the characteristics and service need of children receiving PPC in a regional hospital in HK.

Methods This is a retrospective chart review. All children aged less than 18 years old receiving PPC at a regional hospital in HK from 2015 to 2020 were included.

Results Fifty-eight children received PPC service in the study period. Eight cases were referred for bereavement support after death and were excluded. A total of 50 children (M : F = 24 : 26) were enrolled. Median age of referral to PPC service was 8 years 9 months. Average duration of follow up was 1 year 4 months (median 9 months). Underlying diseases included neurological diseases n=20 (40%), congenital malformations and chromosomal anomalies n=10 (20%), neoplasms n=10 (20%), endocrine and metabolic conditions n=7 (14%), perinatal conditions n=2 (4%) and external causes of morbidity n=1 (2%). Sources of referral included intensivists (32%), general paediatricians (30%), oncologists (14%), neonatologists (12%), neurologists (8%), endocrinologists (2%) and respirologists (2%).

Thirty-nine patients (78%) resided in the community (home 48%, residential schools 30%). Majority of children (60.8%) had high medical needs during their daily care, including wheelchair-bound n=34 (66.7%), gastrostomy feeding n=17