THE DEVELOPMENT OF ACUTE LIVER FAILURE IN PAEDIATRIC INTENSIVE CARE

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Aims Our primary aim was to assess patients who had acute liver complications on the paediatric intensive care unit (PICU) and identify any risk factors associated with this patient group to aid early identification of those at high risk of developing acute liver failure (ALF). Our secondary aim was to assess whether patients with ALF should be referred to gastroenterology earlier to allow for increased opportunity for further management, including referral for transplantation.

Methods A retrospective audit was undertaken looking at a sample size of 28 patients who developed ALF on PICU. The data was collected and analysed for indicators which may be associated with ALF including cardio-pulmonary bypass (CPB) time, RACHS-1 score, length of stay, abnormal liver function tests (LFTs), use of supportive therapies and treatment given. The data collected was then compared with current BSPGHAN guidelines for liver transplantation referral in ALF.

Results 50% of patients had undergone cardiac surgery, within this group, each had a RACHS-1 score of > or = 2 and 86% required CPB. The average CPB time was 266 minutes. The average CPB time for the unit during this period was 183 minutes.

Within the cohort, the duration of stay ranged from 1 – 78 days. Most patients had peak LFTs during days 1 – 3 of admission. 32% of patients had their ammonia levels measured, of those, 78% returned abnormal. 96% required invasive ventilation, 36% required renal support, 29% required ECMO and 86% required inotropic support. 75% of patients were given Vitamin K and 36% were given FFP. The mortality rate was 39%. The average mortality rate for the unit was 2.5 - 3%. Of the patients who died, 27% were referred to gastro, 45% required ECMO and 73% required renal support.

In total, 18% of patients were referred to gastroenterology. Currently there are no guidelines used within PICU for referral to gastroenterology, therefore we assessed our cohort in line with the BSPGHAN guidelines. 93% met the criteria for referral to transplant centre.

Conclusion Most patients who developed ALF were less than one year of age and had a cardiac background. Through analysis of the cardiac cohort, we concluded that ALF was associated with a variety of cardiac operations, longer CPB time and a RACHS-1 score of > or = 2. Analysis of the entire cohort showed great variation between the length of stay, duration of invasive ventilation and the treatment given. Most patients had peak LFTs within days 1 – 3 of admission and the mortality rate in our cohort was much higher when compared to the unit average at that time. In addition, we concluded that a high proportion of patients who met the criteria for liver transplantation were not referred to gastroenterology.

Presenting this audit to the PICU has led to increased awareness of ALF within PICU and highlighted the need to create guidelines for referral to gastroenterology for use in daily practice.

REFERENCE

1. Investigation and treatment of liver disease with acute onset, British Society of Paediatric Gastroenterology, Hepatology and Nutrition (BSPGHAN).

IMPACT OF PAEDIATRIC MULTISYSTEM INFLAMMATORY SYNDROME TEMPORALLY ASSOCIATED WITH COVID-19 (PIMS-TS) ON CRITICAL CARE – AN HDU EXPERIENCE

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Aims

Background Alder Hey is a tertiary children’s hospital in North-West England with co-located Intensive Care and High Dependency units, covering North West England, North Wales and Isle of Man.

PIMS-TS is a new multisystem inflammatory condition which has led to an increased demand on critical care beds. Some children presenting with PIMS-TS need haemodynamic support in the form of inotropes, which would traditionally need an PICU bed.

Aim Review of all patients managed on Critical Care with PIMS-TS.

Methods All patients in the region were discussed in a PIMS-TS multidisciplinary meeting attended by Paediatrics, Infectious Diseases, Rheumatology, Cardiology and Critical Care daily. Patients across the region needing haemodynamic support or cardiology evaluation were highlighted as, in need of either HDU or PICU bed and transferred by the North West & Wales Paediatric Transport Service (NWTS).

This is a retrospective analysis of all children admitted to HDU or PICU with a diagnosis of PIMS-TS, from October 2020-December 2021.

Results Thirty (10%) patients were admitted to HDU from the 300 patients discussed over the 15month period. 16 (53%) of patients were female. Mean age was 10 years (range 3–17). Median length of stay (LOS) on HDU was 2 days (range 1-8) with a median hospital LOS of 6 days (range 2-10).

All patients admitted were monitored appropriately and had full echocardiography assessment.

Twenty nine (97%) patients admitted to HDU required inotropic support, twelve (40%) patients required a single agent and seventeen (57%) required double agents with a combination of adrenaline, noradrenaline and milrinone.

Median fluid resuscitation was 40mls/kg (range 20-70mls/kg).

Eight patients (27%) were escalated to PICU for either invasive ventilation (4) or higher inotropic requirements of 0.2micrograms/kg/minute. There were no adverse events.

Conclusion Most children with PIMS-TS have low to moderate haemodynamic instability that can be safely managed on HDU with appropriate monitoring and agreed limits to vasopressor therapy. Our experience in managing with these patients successfully and safely in a high dependency setting has helped in the use of a critical care bed efficiently, thus reducing dependency on the availability of a PICU bed.