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Death in Pediatric Intensive Care Unit: Not for Children with Acute Pancreatitis

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Keywords

pancreatitis; mortality; children; severe acute pancreatitis; outcome

In this issue of the *Journal of Pediatric Gastroenterology and Nutrition*, Goday et al (1) report on the outcomes of children with acute pancreatitis discharged from the Pediatric Intensive Care Units (PICU) using a multicenter database, Virtual PICU Systems (VPS)[LLC]. They found that mortality from acute pancreatitis was rare compared to the adult series.

Recent studies estimate the annual incidence of pediatric acute pancreatitis similar to the rates reported in adults (2). Most children with acute pancreatitis have a mild course (3, 4). In a subset of patients, the disease becomes severe with the emergence of local and systemic complications (i.e. peripancreatic fluid collections, single or multiple organ failure) (5). Adults who develop persistent organ failure and/or infected pancreatic necrosis are at increased risk of death from acute pancreatitis (35-50%) (6). The overall outcomes are better in children compared to adults: the death rate from acute pancreatitis is less than 10% in children and associated with severe disease and presence of systemic complications (3, 4, 7). In children, the etiologies of acute pancreatitis are diverse. Biliary/obstructive factors, medications and multisystem diseases are the main causes of acute pancreatitis in the pediatric age group (3, 4, 8).

Goday et al (1) focused their questions on the outcome of children admitted to PICU with acute pancreatitis, utilizing VPS. VPS is a clinical database with over 110 hospital members who collect information from all PICU admissions, including demographics, discharge diagnoses (primary and secondary), interventions, severity of illness scores and mortality data. The authors used two severity of illness scores: Pediatric Index of Mortality-2 (PIM2, based on data obtained at the time of PICU admission) and PRISM III scores (based on data obtained during the first 24 hours of PICU admission). Other outcome measures included PICU length of stay, incidence and duration of mechanical ventilation and mortality rate. Of the 360,612 PICU discharges over a 4 year-period, they analyzed 2,076 patients with the diagnosis of acute pancreatitis. In 331 patients, acute pancreatitis was the primary diagnosis;

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in 1,695 patients, acute pancreatitis was a secondary diagnosis (other diagnoses were also present).

The authors found a low mortality rate in children who were admitted to PICU with acute pancreatitis as the primary diagnosis (0.3%, only 1 patient died) compared to children with secondary acute pancreatitis (6.8%). Children with primary acute pancreatitis had lower PIM2 and PRISM III scores, shorter PICU stays and fewer days of mechanical ventilation compared to the secondary acute pancreatitis group. The data from this large cohort of patients confirm the findings in other single-center pediatric studies that reported similar mortality rates that were mostly related to multisystem disease rather than acute pancreatitis alone (3, 4). Whether it was a primary or secondary diagnosis, the mortality rate from acute pancreatitis in children is much lower compared to the adult population.

There are limitations in our understanding of pediatric pancreatitis and the reasons why the mortality rate is lower in children compared to adults. Goday et al (1) were not able to study whether this striking difference is due to fewer cases of severe acute pancreatitis in children. They were not able to assess the etiologies of acute pancreatitis nor evaluate for the presence of complications and disease severity. It is also not known whether patients with acute pancreatitis were diagnosed using well-established criteria (9) or they were all uniformly in critical condition to be admitted to the PICU at all centers. It is possible that the diagnosis of acute pancreatitis was missed or inaccurate. The database did also not allow the authors to determine whether acute pancreatitis was present upon admission or developed during the course of PICU stay. Nevertheless, the study analyzes a large group of children admitted to PICU and reports that acute pancreatitis possibly has a different course in children with lower mortality rates compared to adults.

The authors found that the weight z scores were much higher in patients with primary acute pancreatitis compared to the secondary acute pancreatitis group. Therefore, the obesity did not seem to correlate with disease mortality as observed in adults (10). However, it is not known whether obesity is associated with disease severity in pediatric acute pancreatitis.

Large pediatric inpatient databases are useful in understanding relatively rare diseases by defining demographics, assessing for comorbidities, identifying disease burden and evaluating national trends. Goday et al (1) followed a strategy similar to a recent study that utilized the Healthcare Cost and Utilization Projects Kids' Inpatient Database (HCUP-KID) to demonstrate an increased incidence and disease burden of pediatric acute pancreatitis (7). The data are not collected prospectively or with the study question in mind, therefore may not be suitable for a thorough analysis. Future studies should include a multicenter, prospective design to analyze the epidemiology and severity of acute pancreatitis, its outcomes and disease predictors in children.

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