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Original Research Paper

Acute kidney injury in pediatric patients with sepsis

Medical Science

KEYWORDS: Acute kidney injury, sepsis, pediatrics

Amit Gupta — Department of Pediatrics: MLN Medical College, Allahabad

Anil Rawat — Department of Pediatrics: MLN Medical College, Allahabad

ABSTRACT

Background: Acute kidney injury has been less extensively studied in the pediatric population. Most of the studies are limited to critically ill children admitted to the Pediatric Intensive Care Unit. Aim: The current study was undertaken to study the clinical profile of paediatric patients with sepsis with acute kidney injury, admitted to a tertiary care teaching hospital. Methods: It was a prospective, observational study done over a duration of 12 months (April 2015 – March 2016). Patients having sepsis with acute kidney injury were enrolled in the study. Data were recorded in a pre-formed, standardized pro forma and analysed using the software Epi-info version 7.1.5. Results: A total number of 350 patients with sepsis were admitted during the study period, of whom 120 (34.2%) patients who developed AKI, were included in the study. The mean age of presentation was 3.5 years (Range 1-6 years). Most common underlying single diagnosis for sepsis was pneumonia (66%), followed by acute gastroenteritis (56%), bacteremia (55.2%), urinary tract infections (35%), skin and soft tissue infections (12.6%). A mixed etiology was seen in 73.5% cases. AKI was associated with Multi organ dysfunction syndrome in 31.3% patients. A total of 107 (89.1%) patients improved and were discharged. Mean duration of hospital stay was 18 days (Range 7-29 days). Conclusion: AKI is not uncommon in pediatric patients with sepsis. Most common etiology for sepsis wass a mixed one and the most common single etiological diagnosis was pneumonia.

INTRODUCTION

Acute kidney injury is a known complication in patients with sepsis. Risk factors for mortality in children with acute kidney injury are associated with sepsis severity (1). Streptococcus pneumoniae sepsis has high morbidity, particularly if complicated by renal injury (2).
The current study was undertaken to study the clinical profile of paediatric patients with sepsis with acute kidney injury, admitted to a tertiary care teaching hospital.

METHODS

It was a prospective, observational study done in the paediatric department of a tertiary care teaching hospital over a duration of 12 months (April 2015 – March 2016). Ethical clearance was obtained from the institutional ethics committee. Patients having sepsis with acute kidney injury were enrolled in the study. Neonates, children with acute kidney injury due to causes other than sepsis and those whose parents did not consent were excluded from the study. Urine output was monitored hourly.

Sepsis was defined as systemic inflammatory response associated with suspected or proven infection (3). Acute kidney injury (AKI) was defined as rise in serum creatinine by 50% or oliguria (<0.3 ml/kg/hour for >24 hours or anuria for 12 hours) (3). Oliguria was defined as urine output <0.5 ml/kg/hour.

Data were recorded in a pre-formed, standardized pro forma and later entered into an MS-EXCEL 2007 worksheet and analysed using the software Epi-info version 7.1.5.

RESULTS

A total number of 350 patients with sepsis were admitted during the study period, of whom 120 (34.2%) patients who developed AKI, were included in the study. The mean age of presentation was 3.5 years (Range 1-6 years) Male: Female ratio was 1:1 (1.08:1). The majority (58%) belonged to rural areas. Most common single underlying diagnosis for sepsis was pneumonia (66%), followed by acute gastroenteritis (56%), bacteremia (55.2%), urinary tract infections (35%), skin and soft tissue infections (12.6%). A mixed etiology was seen in 73.5% cases (which was the overall most common underlying cause of sepsis). Mean serum creatinine levels were 2.8 mg/dl and mean serum potassium was 6.2 mmol/l. Oliguria was present in 22.3% patients at some time during the course of their illness. AKI was associated with MODS (3) (Multi organ dysfunction syndrome) 31.3% patients. A total of 107 (89.1%) patients improved and were discharged. Mean duration of hospital stay was 18 days (Range 7-29 days).

DISCUSSION

In this study, most common underlying cause of sepsis leading to septic shock was mixed infection.

Thirty four percent patients with sepsis developed acute kidney injury in our study. A study by Fitzgerald JC et al (2) found that 'severe' AKI was seen in 21% of their patients. Many other studies on pediatric AKI have evaluated the same in PICU patients and not in patients with sepsis per se. (4, 5, 6).

The most common etiology for sepsis, included a mixed site infection in this study, while otherwise the most common admission diagnosis in patients with AKI requiring PICU admission was haemolytic uremic syndrome (7).

Outcome of acute kidney injury is generally poor. Mortality was seen in 13 (10.8%). Mean duration of hospital stay in our study was 18 days. Studies have also reported a higher mortality in patients with AKI (1, 7, 8).
The limitation of our study is that no intentional attempt has been made to identify the most common etiological agent associated with sepsis. Also, therapeutic interventions required for management were not studied.

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