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Study of factors associated with acute kidney injury in patients with cirrhosis

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Background & Objectives: There have not been ample amount of studies in India that can clearly determine the risk factors that leads to the development of AKI in case of cirrhosis, especially regarding the utility of new biomarkers of AKI in cirrhosis. We aimed to correlate the association between some investigatory parameters and new biomarkers of AKI to determine the incidence and risk factor of AKI and to determine the outcome of AKI in patients with cirrhosis at PGIMER.

Methods: We enrolled 149 patients with cirrhosis admitted PGIMER and divided them into two groups, those who had AKI and those who did not develop AKI at admission. At the end of 4 months, we evaluated the factors more prevalent in the group that developed AKI and that had high one-month mortality.

Results: 149 cirrhotic patients were studied with mean age and weight of 49.02 years and 66.16 kilograms respectively and 87.9% (131) of study population were male. The incidence of AKI in hospitalized cirrhotic patients is about 64% (96). The cause of liver cirrhosis was mainly alcohol (55.03%) related, followed by multifactorial origin, chronic hepatitis and non-alcoholic fatty liver disease. Majority of patients had presented with complains of abdominal distension (65.1%) followed by jaundice and decrease in urine output. Cirrhotic patients who have developed AKI have also had cirrhosis related complication (spontaneous bacterial peritonitis, hepatic encephalopathy, shock and need of mechanical ventilation) in significantly higher proportion than those patients who haven't developed AKI. Higher age of patients at the time of presentation, presence of hepatic encephalopathy, presence of ascites and presence of spontaneous bacterial peritonitis; lower serum total protein and higher urinary NGAL are independently associated with development of AKI in cirrhotic patients. Majority of the cause of AKI in cirrhotic patient were related to sepsis (60.4%) followed by HRS. The former was more prevalent as the stage of AKI increased and latter as the stage decreased. In our study, 53% (79) of the patients had one-month mortality, among which 82% (65) were those that had developed AKI. Among the patients who died within 1 month, 36.7% (29) had in-hospital mortality and patient having AKI constituted 97% (28) of it. Need of mechanical ventilation and elevated activated partial thromboplastin time are independently associated with increased one-month mortality in cirrhotic patients.

Conclusions: From our study, we conclude that presence of AKI carries a bad prognosis in patients with cirrhosis and the prognosis gets worse as the stage of AKI does increase. The higher urinary NGAL is independently associated with presence of AKI and it is also associated with increased one-month mortality. Higher activated partial thromboplastin time and need of mechanical ventilation is independently associated with increased one-month mortality.

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