

An Observational Study of Acute Kidney Injury in cases of Acute Pancreatitis

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Abstract: Objectives: To study the clinical scenario of acute kidney injury among cases of acute pancreatitis in a tertiary care center. **Materials and methods:** Cases of acute pancreatitis admitted in medical wards of government general hospital, Guntur during a study period of June 2017 to September 2018, who developed acute kidney injury were analyzed for clinical presentation, laboratory parameters, management and outcome.

Results: 22 cases were found to have acute kidney injury, 6 were females and 16 were males with male: female ratio 2.6:1 with majority in the age range of 31 - 40 years. Pain abdomen was common presenting complaint in all cases, shortness of breath in 36.4%, fever in 27.8%, and oliguria in 27.3%. Laboratory parameters like leukocytosis was seen in 54.5%, elevated amylase and lipase in 50%, hepatitis in 81.8%. Shock was observed in 63.6%, hypoxemia with ARDS in 27.8%, MODS in 36.4%. RRT was given for 31.81% in the form of hemodialysis. 45.4% have complete recovery from pancreatitis and renal function. 54.5% cases expired. 18.18% have recurrent episodes of pancreatitis with no evidence of previous renal injury.

Conclusion: Early recognition of AKI in order to prevent severe complication like septic shock, intraabdominal hypertension or abdominal compartment syndrome leading to multiple organ dysfunction syndrome is a crucial tool in intensive care. AKI is the dreaded complication of acute pancreatitis. No cases requiring renal replacement therapy survived.

Key words: Acute Pancreatitis (AP), Acute Kidney Injury (AKI), Intra Abdominal Hypertension (IAH), Acute Respiratory Distress Syndrome (ARDS), Multiple Organ Dysfunction Syndrome (MODS), Renal Replacement Therapy (RRT).

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I. Introduction

Acute pancreatitis (AP) is the most common inpatient gastrointestinal diagnosis and is a medical emergency. AP is an acute inflammatory process of the pancreas with variable involvement of other regional tissues or remote organ systems. Mild acute pancreatitis is without local complications or organ failure. It is self-limited and subsides spontaneously usually within 3–7 days after treatment is instituted. Moderately severe acute pancreatitis is characterized by transient organ failure (resolves in less than 48 hr) or local or systemic complications in the absence of persistent organ failure. Severe acute pancreatitis is characterized by persistent organ failure (more than 48 hr). Organ failure can be single or multiple⁽¹⁾.

II. Materials and methods

This is a retrospective study done in department of general medicine, Guntur medical college, during 2017 and 2018. Case records of acute kidney injury in association of acute pancreatitis were analyzed for clinical scenario, laboratory parameters, treatment received and final outcome.

Acute pancreatitis was diagnosed when patient presented with pain abdomen radiating to back, more than three times elevation in serum amylase and or lipase and radiological evidence. Acute kidney injury definition includes the following diagnostic criteria;

An abrupt (within 48 hours) absolute increase in the serum creatinine concentration of >0.3 mg/dl from baseline a percentage increase in the serum creatinine concentration of >50% or oliguria of less than 0.5 ml/kg per hour for more than 6 hours⁽²⁾

All cases of diabetic keto acidosis, chronic kidney disease, and acute intestinal obstruction were excluded from the study.

III. Results

Of 22 patients studied, 6 were females and 16 were males with male: female ratio 2.7:1 with majority in the age range of 31 - 40 years. Pain abdomen was common presenting complaint in all cases (100%), fever in 6 cases (27.27%), shortness of breath in 8 cases (36.36%), and decreased urine output in 6 cases ((27.27%), leukocytosis was seen in 9 cases (40.9%), 18 patients (81.8%) were icteric.

The cause for pancreatitis was alcohol intake in 9 cases, among these, 4 have smoking in addition to alcohol, vasculitis due to connective tissue disorder SLE, in 2 cases, anti epileptic drug sodium valproate in one case, cholelithiasis in 3 cases and cause is unknown in the remaining cases.

All the cases were treated with IV antibiotics, and fluid resuscitation. 14 cases (63.63%) were in circulatory failure who were given inotrope support. Hypoxemia with ARDS was seen in, 6 cases (27.27%), who were given MV support. 8 cases (36.36%), were having MODS. 7 cases (31.81%) were given RRT in the form of hemodialysis. Complete recovery from pancreatitis and renal function was seen in 10cases (45.4%) 12 cases (54.54%) expired. Of these 22 cases, 4 cases (18.18%) have recurrent episodes of pancreatitis with no evidence of previous renal injury.

Table1: Case Scenario

Parameter	Total Number of Cases (n=22)
Male	16 (72.7%)
Female	6 (27.3%)
Pain abdomen	22 (100%)
Shortness of breath	8 (36.4%)
Fever	6 (27.3%)
Oliguria	6 (27.3%)
Leukocytosis	12 (54.5%)
Hepatitis	18 (81.8%)
Elevated amylase, &/lipase	11 (50%)
Circulatory failure	14 (63.6%)
ARDS	6 (27.3%)
MODS	8 (36.7%)
RRT received	7 (31.8%)
Death	12 (54.5%)
Recovered	10 (45.4%)
Recurrence of AP	4 (18.2%)

Table 2: Comparative characteristics

Parameter	Recovered (n=10)	Died(n=12)
Male	6	10
Female	3	3
Oliguria	1	5
Hepatitis	10	8
Circulatory failure	3	11
ARDS	1	5
MODS	1	5
RRT	0	7

IV. Discussion

AKI is one of the commonest complications of AP, depending upon the severity. various mechanisms have been proposed for development of AKI in AP, like, hypoxemia, endotoxins, release of pancreatic amylase from the injured pancreas with resulting impairment of renal microcirculation, decrease in renal perfusion pressure due to abdominal compartment syndrome, intraabdominal hypertension and hypovolemia⁽³⁾. But, the exact mechanism of cell toxicity was unknown. Inappropriate activation of trypsinogen to trypsin, with activation of digestive enzymes causes pancreatic injury and can progress beyond pancreas to a systemic inflammatory response syndrome, finally MODS and death In many cases⁽⁴⁾.

There is considerable variation in age and sex distribution, In this study youngest was 17 year old and the eldest was 58 year old, with majority in the age range of 31 - 40 years. Male to female ratio was 2.7:1. Males outnumbered females in this study probably because alcohol consumption is more common in males in our society and more in middle age people. The age incidence was in correlation with study done by Kumar R, Pahwa N et al⁽⁵⁾. But gender difference in outcome could not be made out from our study.

From studies by Tran DD et al⁽⁶⁾ better outcome for non-oliguric renal failure was established. In our study, 72.7% were non oliguric with similar outcome as that of oliguric patients, in accordance with Rubina Naqvi et al⁽⁷⁾ Alcohol was a significant risk factor in our study, both for acute pancreatitis and for acute kidney injury, alcohol increased and or perpetuated the risk of atherogenesis^(8,9,10) which is well in correlation with study done by Kumar R, Pahwa N et al⁽⁵⁾.

V. Conclusion

Very poor prognosis in cases of acute pancreatitis with Acute kidney Injury. More than two systemic complications, which, if not resolved in 48 hours will finally succumb in spite of supportive and specific treatments like mechanical ventilatory support, inotrope support and hemodialysis.

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