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CLINICAL PROFILE OF ACUTE KIDNEY INJURY IN A TERTIARY CARE HOSPITAL

General Medicine

Dr. S. Naga Mohana Rao Associate Professor Department of General Medicine Alluri Sitarama Raju Academy of Medical Sciences Eluru, Andhra Pradesh 534005.

Dr. K. Venkatesh* Postgraduate Department of General Medicine Alluri Sitarama Raju Academy of Medical Sciences Eluru, Andhra Pradesh 534005. *Corresponding Author

Dr. G. Swarnalatha Devi Professor & HOD Department of General Medicine Alluri Sitarama Raju Academy of Medical Sciences Eluru, Andhra Pradesh 534005.

ABSTRACT

Introduction: Acute kidney injury (AKI) causes 2-5 % of acute care hospital admissions and 20 – 30 % admissions to intensive care unit. AKI may be community acquired or hospital acquired. To evaluate the causes, clinical profile of AKI in this study.

Material and Methods: it is a cross sectional observational study of 100 patients with AKI. Complete patient history, physical examination, routine and specific laboratory investigations were done to find out the etiology, clinical features and outcome of AKI.

Results: Maximum incidence (22%) of AKI was seen in the age group between 25- 34 years. The most common clinical features were vomiting (92%), oliguria (80%), and fever (70%). The incidence of prerenal, renal and postrenal AKI was 20%, 76%, 4% respectively; Malaria (34%) was the predominant cause of AKI in our study. In our study mortality was seen in 10% of the patients, of which most of the patients had septicemia and associated complications like respiratory failure.

Conclusion: Good survival rate depends on early diagnosis and early intervention.

KEYWORDS

Acute kidney injury, Malaria, Septicemia.

INTRODUCTION:

Acute kidney injury (AKI) is a clinical syndrome that is denoted by an abrupt decline in glomerular filtration rate (GFR) sufficient to decrease the elimination of nitrogenous waste products (urea and creatinine) and other uremic toxins1. This has traditionally been referred to as acute renal failure (ARF), but in recent years an effort has been made to implement the term acute kidney injury instead. The definition for AKI which is used in clinical and epidemiologic studies is based on specific criteria that have been sequentially developed. The Kidney Disease: Improving Global Outcomes (KDIGO) definition and staging system is the most recent and preferred definition.

The KDIGO guidelines define AKI as follows 2

- Increase in serum creatinine by ≥0.3 mg/dL (≥26.5 micromol/ L) within 48 hours, or
- Increase in serum creatinine to ≥1.5 times baseline, which is known or presumed to have occurred within the prior seven days, or
- Urine volume <0.5 mL/kg/hour for six hours.

AKI is responsible for major morbidity and mortality of hospitalized patients because of serious nature of the underlying illness and the high incidence of complications. AKI is usually asymptomatic and diagnosed when biochemical monitoring of hospitalized patients reveal a recent increase in blood urea and creatinine concentration. AKI may be community acquired or hospital-acquired.3 Common causes of community-acquired AKI include volume depletion, adverse effects of medications, and obstruction of the urinary tract. The most common clinical settings for hospital-acquired AKI are sepsis, major surgical procedures, critical illness involving heart or liver failure, intravenous iodinated contrast administration, and nephrotoxic medication administration. AKI is a common clinical condition in hospitalized patients. The incidence of AKI in hospitalized patients is between 2% and 5%. 4 In a study done showed oliguria was common clinical feature seen is 85.2% of patients followed by clinical features of encephalopathy, vomiting, and acidosis.4 The most common causes of AKI are ; volume depletion, hypotension, aminoglycoside antibiotics and radiocontrast agents. Major surgery is also an important cause of AKI. Advanced age, liver diseases, underlying renal insufficiency and diabetes have been implicated as risk factors for the development of AKI.4

MATERIALS AND METHODS:

Acute kidney injury is a common clinical condition encountered in our hospital. This study is an attempt to analyze the common causes and clinical manifestations of acute kidney injury. This prospective study was done at ASRAM Hospital over a period of two years. This study included 100 patients with clinical and laboratory evidence of acute kidney injury in patients admitted to our hospital.

Study populations: 100 patients of acute kidney injury admitted and /or attended opd of general medicine and nephrology department asram medical college and hospital.

INCLUSION CRITERIA:

- All patients with clinical and / or biochemical evidence of acute kidney injury.

EXCLUSION CRITERIA:

- Patients aged below 18 years.
- Patients with preexisting chronic renal failure or chronic kidney disease.

METHODOLOGY:

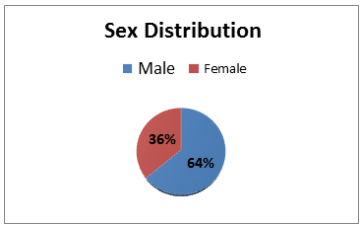
All the patients included in the study are subjected to investigations like Serum creatinine, blood urea nitrogen, Complete blood count, Random blood glucose, urine routine examination, serum electrolytes, Arterial blood gas, Malarial antigen test, leptospiral rapid diagnostic tests, blood and urine cultures for sepsis patients.

RESULTS

A total number of 100 cases of acute kidney injury patients, admitted to Asram Medical College and Hospital, Eluru; who met the inclusion criteria were studied.

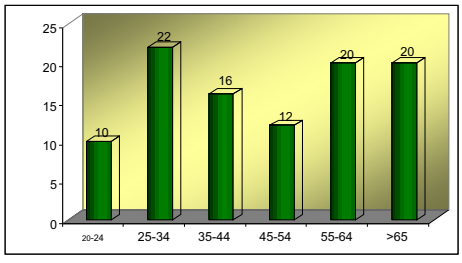
1. Sex Distribution:

Out of 100 cases studied, 64 were males and 36 were females.



2. Age Distribution:
The people in the study ranged from 20 to 70 years with mean age of 48.1years. These patients were divided into six age groups.

Figure – 2 Graph representing age group



The ratio of Male: Female was 1.8: 1. The maximum incidence was seen in the age group between 25 to 34 years.

3. Clinical Symptoms:
Out of 100 cases, 92 patients had vomiting, 80 had oliguria and 72 patients had history of fatigue. Fever was seen in 70 cases and 32 patients had loose stools.

2. Clinical Signs:
Out of total number of patients studied 30 patients had hypotension, 28 patients had edema and 24 had icterus on general physical examination.

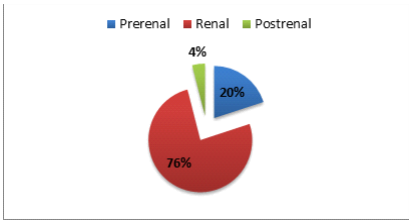
Table – 1 SIGNS AND SYMPTOMS

Symptoms and Signs	Number	Percentage
Vomiting	92	92.0
Oliguria	80	80.00
Fatigue	72	72.0
Fever	70	70.00
Loose stools	32	32.0
Edema	28	28.0
Jaundice	24	24.0

5. Past History:
Out of 100 patients, 12 had history of nephrotoxic drug intake. Out of 100 patients, 12 patients had history of diabetes mellitus and 12 patients had hypertension.

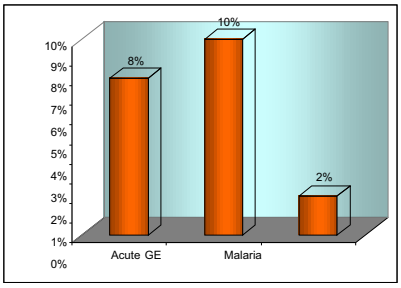
6. Type of Acute kidney injury:
Out of 100 cases, Renal AKI was seen in 76 patients, 20 patients had prerenal AKI and 4 had post renal AKI.

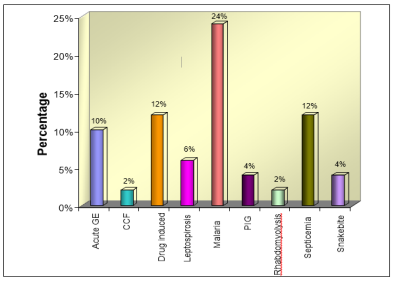
Figure -3 TYPE OF AKI AND DIAGNOSIS



7. Presentation of Prerenal AKI:
Out of 100cases studied, 20 patients had prerenal AKI. Out of which, 8 patients had acute GE, 10 patients had Malaria and two patients had AKI following septicemia.

Figure- 4 PATIENTS WITH PRE RENAL AKI





8. Post Renal AKI:
Out of 100 cases 4 patients had AKI following bladder outlet obstruction.

9. Management:
Among 100 cases, 74 patients were managed conservatively and 26 patients underwent hemodialysis. Among the patients managed conservatively 2 patients died and among those who underwent hemodialysis 8 patients died.

10. Out Come:
Out of 100 cases studied, 90 patients survived. Mortality was seen in 10 patients. 8 patients had AKI following septicemia and 2 patients died due to drug induced renal failure.

DISCUSSION
In the present study, age of the patients ranged from 20 to 70 years with mean age of 48.1 years. There were 64 were males and 36 were females. We noted that, vomiting and oliguria were most common symptoms comprising of 92% and 80% respectively. This finding is comparable with other studies done by Singhal AS et al., which showed that oliguria was seen in 85.2% of patients and that 80% of patients had vomiting.5 In the present study, fever was seen in 70% of patients. However in other studies this symptom was not observed. This could be explained by higher incidence of AKI associated with infections like malaria, leptospirosis in the present study. In the present study hypotension was seen in 30% of patients which is nearly equals to the study done by Liano F et al.,which was 32.8%.6

Table 2 - Comparative studies showing signs and symptoms

Signs and symptoms	Present study	Singhal AS et al	Bernieh B et al	Liano F et al
Vomiting	92%	85.2%	80%	86%
Oliguria	80%	80%	78%	80%
Fever	70%	-68%	-	-
Fatigue	72%	-	-	-
Hypotension	30%	20.6%	52%	32.8%
Edema	28%	-	20%	-
Jaundice	24%	20%	-	-

In the present study, 12% of patients had AKI following drug nephrotoxicity and is more commonly seen in elderly age group and these patients had associated premorbid conditions. In the present study, 96% of patients had AKI due to a medical cause and 4% due to a surgical cause. In this study 76% patients had AKI due to renal cause. Majority of patients had malaria (34%) of which Pre Renal was 10%

and renal was 24% due to ours being malarial endemic area. Other common presentations were septicemia in 12% patients, drug nephrotoxicity in 12%, leptospirosis 6%, snakebite 4%, acute gastro enteritis10%, Rhabdomyolysis 2%, congestive cardiac failure 2% and post infectious glomerulonephritis was seen in 4% patients. Out of 76 cases, 20 patients underwent haemodialysis, and the rest were managed conservatively. 68 patients had complete recovery of renal functions and 8 patients died. However, those patients who died had septicemia and associated complications like respiratory failure. Singhal AS et al., in their study found that malaria was the predominant cause of AKI involving about 46% of patients followed by snakebite 20% patients, acute GE 12% patients, septicemia 12%, drug nephrotoxicity 3% and acute gastroenteritis in 2% of patients.5 However in a study done by Bernieh B et al., septicemia was the predominant cause of AKI seen in 58% patients followed by drug nephrotoxicity and rhabdomyolysis in 12% and 9% patients respectively.7 However in other studies AKI associated malaria had less incidence. Prakash J et al, in their study of acute renal failure 15% of patients had malaria. P.Falciparum and P.vivax malaria were responsible for AKI in 76 (80.9%) and 11 (11.7%) of the patients.8 Singhal AS et al in their study found 16% of patients with malaria had AKI.5 In the present study, about 4% of the patients had obstructive uropathy.

The course of stay in hospital and outcome of these patients with acute kidney injury is variable. In this study of 100 cases, 90 patients survived and 10 patients expired. (4 males and 6 female) Mean age of recovered patients was 48.33 while mean age of expired patients was 46. Among 100 cases, 74 patients were managed conservatively and 26 patients underwent haemodialysis. The survival rate out of 26 patients who underwent dialysis, was 69.3% (had complete recovery) while 30.7% expired. Among patients who were managed conservatively the survival rate was 97.3%. Early detection and prompt initiation of treatment forms the key in Conservative management. Most of the patients who died had septicemia and associated complications like respiratory failure. In the present study, mortality was seen among the patients who had high serum creatinine at admission while compared to survived patients. Low mortality in our patients is probable due to large number of patients with medical causes of acute kidney injury, younger age, early diagnosis and treatment.

CONCLUSION

A Prospective study of 100 cases of acute kidney injury was done. These patients were diagnosed based on the clinical and laboratory evidence of elevated blood urea and serum creatinine. This study showed Male to Female ratio of 1.8:1.Maximum incidence was seen between 25 and 34 years. The study showed various etiological factors associated with AKI, like Malaria, leptospirosis, snakebite, drug nephrotoxicity, acute gastroenteritis, Post infectious glomerulonephritis, obstructive uropathy. Common symptoms were oliguria and vomiting. Other clinical features were fever, jaundice, fatigue, loose stools. However malaria was the predominant cause of AKI in our study. Many patients had Falciparum malaria. Out of 100 cases, 90% patients survived and 10% patients expired. 74% patients managed conservatively and 26% patients underwent haemodialysis. We observed that for good survival rate early diagnosis and early intervention were probably responsible. The major risk factors affecting prognosis of the patients were presence of multi organ failure, high baseline serum creatinine level and complications developed during the course of illness.

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