

A Study of Clinical Presentation and Outcome of Patients with Acute Kidney Injury in a Tertiary Care Hospital

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Abstract

This study was done to study the clinical, etiological profile, identification, classification and to study the impact and outcome of acute kidney injury. By convenient sampling patients were invited to take part in this study. All patients with clinical and biochemical evidence of acute kidney injury according to AKI NETWORK criteria were included. The patients were screened if he/she satisfied the eligibility criteria. The results of the analysis were validated statistically. It was found that the incidence of AKI was more in males as compared to females and it was maximum in the age group of 40-60 years. Alcoholics and smokers were at a higher risk of AKI. Fever was found to be the most common cause of AKI followed by obstruction, sepsis, congestive cardiac failure, poisoning, cerebrovascular accident, chronic liver disease, malaria and drug abuse. Patients with AKIN stage 3 were more likely to go for dialysis than stages 1 and 2. Ultrasound finding was normal in many patients (73.6%) followed by renal calculi (8.3%), carcinoma (4.2%), HUN (1.4%), ascites (6.9%) and cystitis (5.6%). A higher proportion of patients were found to have deranged liver enzymes (increased OT - 83.3%) as compared to normal (16.7%). Patients prone for AKI with hyponatremia is around 37.5% and those with normal sodium value are 62.5%. Most patients were managed conservatively (88.9%) and a few were taken up for dialysis (11.1%). The survival rate was 98.6% and mortality rate was 1.4%.

Keywords: Acute Kidney Injury; AKI; Clinical Profile; Etiological Profile

Introduction

Acute kidney injury (AKI) is a syndrome characterized by rapid (hours to weeks) decline in glomerular filtration rate, retention of

nitrogenous waste products like blood urea nitrogen (BUN), creatinine, electrolyte and acid base imbalance. Renal dysfunction is broadly classified as Acute renal failure and chronic renal failure on

the basis of time of onset and duration of disease. Earlier termed as acute renal failure which is replaced by Acute kidney injury, it is one of the very common entity affecting patients with variety of illnesses. According to traditional classification they are divided into three main categories: pre-renal, intrinsic and post renal AKI. Acute Kidney Injury is common in older adults of all people admitted in hospitals. About 30% of patients admitted in ICU develop AKI with debilitating complication like hyperkalemia, pulmonary edema, encephalopathy, multi-organ dysfunction, metabolic acidosis, and sometimes leading to death of the patients. But kidney is unique in its ability to recover completely from an acute kidney injury provided appropriate supportive measurement and therapeutic measures are done at the right time. Hence there is a need to conduct studies on the varied clinical spectra of AKI to gather adequate data necessary to improve the management of this entity.

Various classifications have been made to quantify the severity of AKI. The most commonly recognized are

- RIFLE criteria
- AKIN criteria
- KDIGO criteria.

The main goals of nondialytic management of AKI are the maintenance of fluid and electrolyte balance, avoidance of nephrotoxic medications, adequate nutrition, treatment of infections, correction of reversible prerenal (e.g. hypovolemia) and post renal factors (obstructive pathologies), proper dose adjustments of medications and close monitoring for progression of disease. Renal replacement therapy may be indicated if the patient doesn't respond to conservative management. The main indication of RRT are:

- Refractory fluid overload
- Refractory hyperkalemia (plasma potassium > 6.5) or rapidly rising potassium levels
- Signs of uraemia, such as pericarditis, neuropathy or Unexplained decline in mental status
- Refractory metabolic acidosis (pH < 7.1)
- Anuria.

Materials and Methods

The study was conducted at Saveetha Medical College Hospital after obtaining Permission from Institutional Ethics and research

committee. The study period was done from February 2016 to April 2017. Based on the available data and the number of Acute kidney injury patients visiting our Saveetha Medical College Hospital the minimum sample size was calculated with relative precision of 15% at 5% significant levels as 69.

By convenient sampling patients were invited to take part in this study, 72 patients who provided consent were included in the study. All patients with clinical and biochemical evidence of acute kidney injury with normal baseline creatinine according to AKI NETWORK criteria were included. The exclusion criteria included patients not willing to participate in the study, age below 19 years and patients of established chronic kidney disease.

The study was initiated after presentation of the proposal to and obtaining clearance from both the Scientific Review Board and Institutional Ethics Committee of Saveetha Medical College and Hospital.

All the patients admitted in general medicine with clinical and biochemical evidence of AKI were screened if he/she satisfied the eligibility criteria. The interested patient was given an information sheet with pertinent information. Written informed consent was obtained from all the participants of the study.

Basic demographic details were collected. A detailed history and clinical examination was done for every patient by the principal investigator and the findings were recorded in a semi structured questionnaire along with investigation and treatment. Patient was followed up throughout the course of hospital and detail investigation, treatment and clinical course including complications were recorded. Basic investigation like urine analysis, complete blood counts, fasting lipid profile, fasting and post prandial glucose levels, urea, creatinine, electrolytes, calcium, phosphorus, Fractional excretion of Sodium, both rapid and ELISA (HbsAg, Anti HCV, ANTI HIV) chest x-ray, ultrasound abdomen and pelvis, 12 lead ECG was done.

All the clinical features and biochemical values were tabulated and subjected for statistical analysis using appropriate parametric tests for continuous variables and non-parametric tests for discrete variable with the help of SPSS for windows software version 20. To find the significance in categorical data Chi-Square test was used. A p value of < 0.05 was considered statistically significant.

Results and Discussion

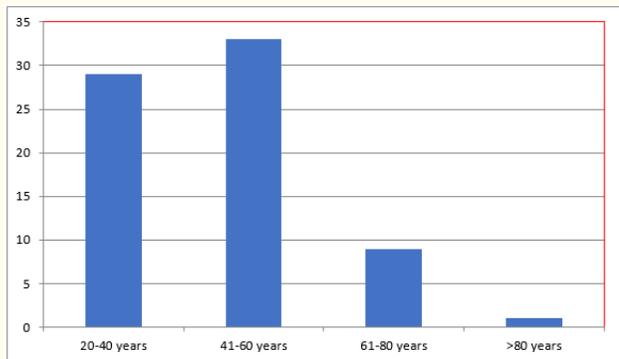


Figure 1: Distribution of the patients according to age.

Most patients were under 41 to 60 years of age group 45.8% (n = 33) and 20 to 40 years age group 40.3% (n = 29), age group between 61 to 80 and age greater than 80 years are 12.5% (n = 9) and 1.4% (n = 1) respectively.

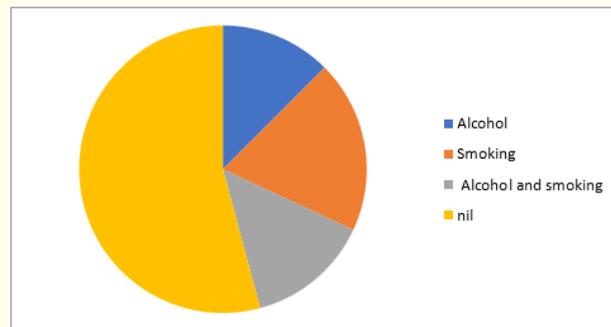


Figure 3: Distribution of patients according to risk factors.

Figure 4: Clinical profile of patients with AKI.

Clinical profile	Frequency	Percent
Fever	19	26.4
Age	10	13.9
Obstructive	12	16.7
Poisoning	4	5.6
Sepsis	10	13.9
CCF	4	5.6
CVA	3	4.2
CLD	3	4.2
Drug induced contrast	2	2.8
Malaria	2	2.8
Others	3	4.2
Total	72	100

Table 1: Clinical profile of patients with Aki.

Figure 2: Distribution of patients treatment according to age.

In this study, about 30 patients were in the age group of 41-60 years. And these patients underwent conservative management.

In the present study, no of smokers where 19.4% (n = 14) and alcoholic 12.5% (n = 9). Patients with no other risk factor where higher 54.2% (n = 39).

In this study, main etiology are fever with 26.4% (n = 19), obstructive 16.7% (n = 12), acute gastroenteritis 13.9% (n = 10), sepsis 13.9% (n = 10), congestive cardiac failure 5.6% (n = 4), poisoning 5.6% (n = 4), cerebro-vascular accident 4.2% (n = 3), chronic liver disease 4.2% (n = 3), malaria 2.8% (n = 2), drug induced 2.8% (n = 2), others 4.2% (n = 3).

Outcome	Frequency	Percent
Dialysis	8	11.1
Conservative	64	88.9
Total	72	100

Table 2: Distribution of patients according to outcome.

In the present study, total of 72 patients were observed of which 62.5% (n = 45) patients were found to be males and 37.5% (n = 27) females. Gender wise distribution showed that male predominance was present. Previous studies showed similar results [1-4].

AKI was predominantly seen in elderly age group. The mean average age was 55 years, which was consistent with previous studies [1,5]. Our study agrees with other Indian studies showing 45.8% were between age group of 41 - 60 years. Age has consistently shown to be a risk factor for Acute Kidney Injury.

The relationship between hypoalbuminemia and acute kidney injury are well known, in our present study hypoalbuminemia were 47.2% (n = 8) of which 7 patients went for dialysis. Similar study conducted by Wiedermann, *et al.* in December 2016 showed that the serum albumin level has to be monitored at regular intervals in order to avoid the mortality and provide appropriate treatment for hypoalbuminemia. Few other studies also agree that hypoalbuminemia is the important predictor for Acute kidney Injury and its outcome [6,7].

AKIN stage III was considered as an independent risk for hospital outcome and ICU mortality by previous studies [8-10]. AKIN criteria provides a mechanism to open doors to improve patient's outcome. Similarly, in our study according to AKIN stage III criteria out of 8 dialysis patients 7 patients successfully encountered dialysis.

In this present study, the main clinical profile were fever (26.4%), Obstructive (16.7%), Sepsis (13.9%), Acute gastroenteritis (13.9%), poisoning (5.6%), congestive cardiac failure (5.6%), chronic liver disease (4.2%), Cerebro-vascular accident (4.2%), Drug induced (2.8%) and Malaria (2.8%). This correlated with previous studies [11-13].

In our study SGOT value is more significant and patients with raised SGOT level are 83.3% (n = 60) and they are almost having equal outcome with patients of normal SGOT. Four patients went on dialysis with elevated SGOT and 4 with normal SGOT. More studies have to be initiated to compare the value of SGOT and acute kidney injury.

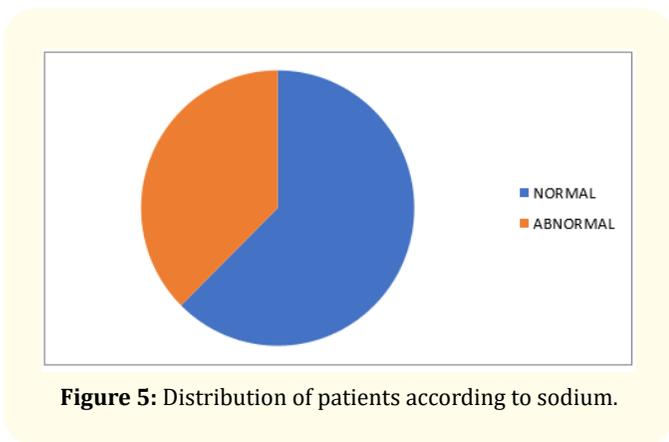


Figure 5: Distribution of patients according to sodium.

In our study the patients prone for AKI with hyponatremia is around 37.5% (n = 27) and the sodium of normal value are 62.5% (n = 45).

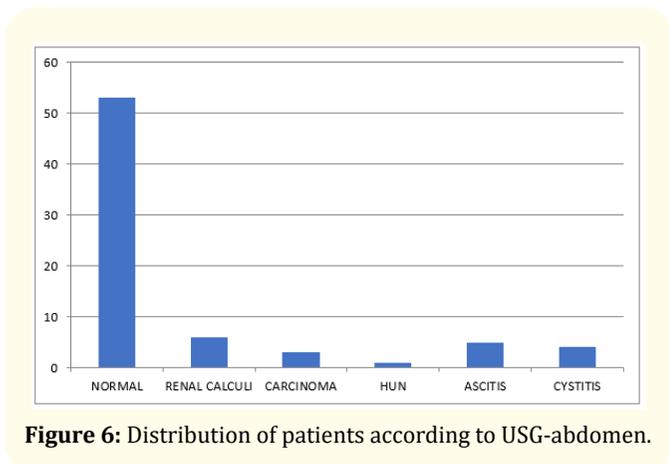


Figure 6: Distribution of patients according to USG-abdomen.

In this study patients with normal USG Abdomen are 73.6% (n = 53), the rest are classified a renal calculi, carcinoma, HUN, ascites, cystitis with 8.3% (n = 6), 4.2% (n = 3), 1.4% (n = 1), 6.9% (n = 5), 5.6% (n = 4) respectively.

This is an observational study of about 72 cases of Acute kidney injury admitted in Saveetha Medical college and Hospital. We used a diagnostic criterion AKIN.

In the present study, out of 72 patients 11.1% (n = 8) went for renal replacement therapy and 88.9% (n = 64) patient went for conservative treatment [14,15].

Conclusion

Acute kidney injury is a common entity complicating the hospitalized patients. The most common clinical features are fever with dehydration, acute gastroenteritis and sepsis. Obstructive cause is more common in our study, where renal calculi is a major source of obstructive pathology with exception of HUN secondary to calculus gone for dialysis. Rest of the cases were managed conservatively. According to Acute Kidney Injury Network criteria Stage III patients are more prone to dialysis with male predominance on the higher side, whereas Stage II and I was treated conservatively.

Early diagnosis and early intervention were probably responsible for good survival rate. Determining the cause of AKI is vital to start therapy to reverse AKI. In prerenal cause of AKI, fluid replacement is the main form of therapy. Drugs causing AKI should be identified and stopped. During an episode of AKI, measures should be taken to avoid further nephrotoxin exposure. Loop diuretics should be reserved for pulmonary edema or hyperkalemia. Assessment of renal function should be done using creatinine clearance. Initiating dialysis earlier may improve outcomes. Patients experiencing an episode of AKI should be followed up for resolution of injury within first 90 days and to evaluate for the development of CKD.

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