Research Article

A study of clinical profile of patients with acute kidney injury in a tertiary care centre

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Abstract

Objectives: The objectives of the study are to study etiology, manifestations and outcome of acute kidney disease.
Method: In present study, patients with acute kidney disease admitted to Sir T Hospital, Govt. Medical College Bhavnagar between June 2013 and July 2014 are studied with a detailed history, general physical examination, and systemic examination and investigated as per the proforma. Data collected, analysed and the test of significance was calculated by chi square, student's t test.
Results and conclusion: A prospective study of 100 cases of acute kidney injury admitted to Sir T Hospital Bhavnagar between June 2013 and July 2014 is done. Diagnosis of the patients is based on the clinical and laboratory evidence of elevated blood urea and serum creatinine. This study showed male to female ratio of 2.7:1. Maximum incidence is seen between 40-65 years. The study showed various etiological factors associated with acute kidney injury like malaria, snake bite, septicaemia, heart failure, cirrhosis, drug nephrotoxicity and acute gastroenteritis. 8 patients had obstructive uropathy. Common symptoms are oliguria and vomiting, other clinical features are fever, jaundice, loose stool and peripheral edema. However, septicaemia is the predominant cause of acute kidney injury in our study. Out of 100 cases, 93% patients survived and 7% expired. 83% patients are on conservative management and 17% underwent hemodialysis. Out of 100 cases, 51 patients are having associated illness which made them prone to develop AKI. Mortality is also seen more among this group. Most common comorbid illnesses are DM, HTN and IHD.
Keywords: Acute kidney injury, hemodialysis.

1. Introduction

Acute Kidney Injury is a new consensus term, encompassing a range of kidney diseases of acute onset. Two trials, namely program to improve care in acute renal disease (PICARD) and Beginning & Ending Supportive Therapy (BEST) for the kidney confirmed that AKI is a significant contributor toward mortality and morbidity. [1]

RIFLE classification scheme and acute kidney injury network (AKIN) classification scheme have been proposed to achieve early diagnosis of AKI. Reliable and comparable data about the clinical spectrum of AKI is necessary for optimizing the management. However, minimal data is currently available from India using standardized criteria. [1]

In India, Acute Kidney Injury constitutes 1.5% of all general hospital admissions, of which 60% are due to medical causes.[2]the most common causes of AKI are: acute diarrhoeal diseases, sepsis, infection (malaria, UTI, pneumonia, viral hepatitis), snake bite, cardiac failure, diabetes mellitus, nephrotoxic drug use, malignancy, SLE, hypertension etc. major surgery like exploratory laparotomy, whipple's procedure etc are also an important cause of AKI. Advanced age, liver diseases, underlying comorbid illness (DM, HTN, IHD, COPD, cirrhosis) have been implicated as risk factor for the development of AKI. [3]

The burden of AKI may be most significant in developing countries with limited resources for the care of these patients once the disease progresses to kidney failure necessitating RRT. Addressing the unique circumstances and needs of developing countries, especially in the detection of AKI in its early and potentially reversible stages to prevent its progression to kidney failure requiring dialysis, is of paramount importance.AKI is amenable to early detection and potential prevention. There is considerable variability in practice to prevent, diagnose, treat, and achieve outcomes of AKI. [2]

We retrospectively evaluated patients with AKI, using the RIFLE criteria, to answer questions regarding most susceptible population, etiology, role of dialysis, outcomes.

2. Materials and methods

This is a study of 100 patients with acute kidney disease admitted to Sir T Hospital, Govt. Medical College Bhavnagar between June 2013 to July 2014.

Selection criteria:

2.1 Inclusion criteria:

100 patients of acute kidney disease admitted in Sir T hospital Bhavnagar.

2.2 Exclusion criteria:

1. Patients of chronic renal failure.
2. Patients who do not give consent for study.
3. Patients aged below 13 years.

Patients included were studied with a detailed history, general physical examination, and systemic examination and investigated.

Data analysed and conclusions drawn about age and sex distribution, etiology of AKI, classification of AKI and comparison of GFR, creatinine and urea on admission and discharge. The test of significance was calculated by chi square, student's t test.

3. Results

A total number of 100 cases with acute kidney disease, admitted to Sir T Hospital, who met the inclusion criteria, are studied.

Out of 100 cases studied, 73 patients are males and 27 are females.

Table 1: Age distribution

Age	No. of Patients	Percentage
< 24	1	1%
25-34	9	9%
35-44	12	12%
45-54	25	25%
55-64	31	31%
>65	22	22%

Table 2: Distribution of patients according to clinical symptoms

Clinical symptoms	No. of patients
Oliguria	63%
Loose stool	18%
Vomiting	81%
Fever	61%
Edema	37%
Jaundice	5%
Dyspnoea	13%
Altered Sensorium	8%

Figure 1: Comparison of GFR on admission and on discharge/ expired

In this study, GFR on admission was found to be 25.0356 ml/min/1.73m^2 and on discharge 54.352 ml/min/1.73m^2 with P-value of <0.0001.
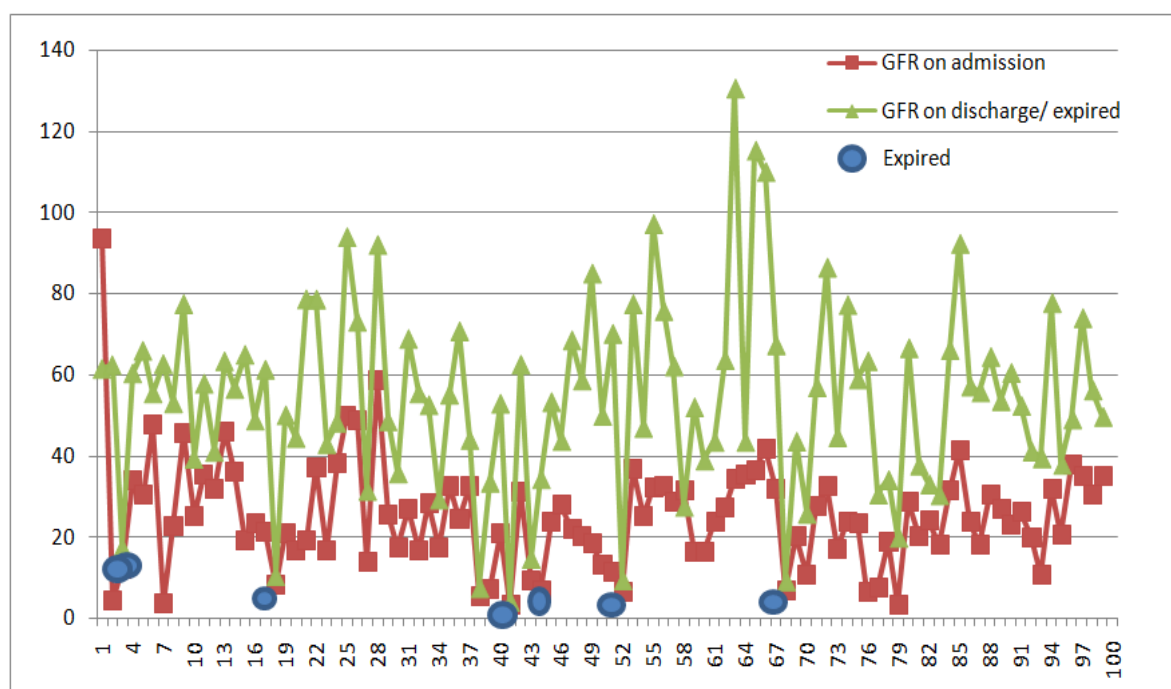
Figure 2: Comparison of serum urea on admission and on discharge or expired
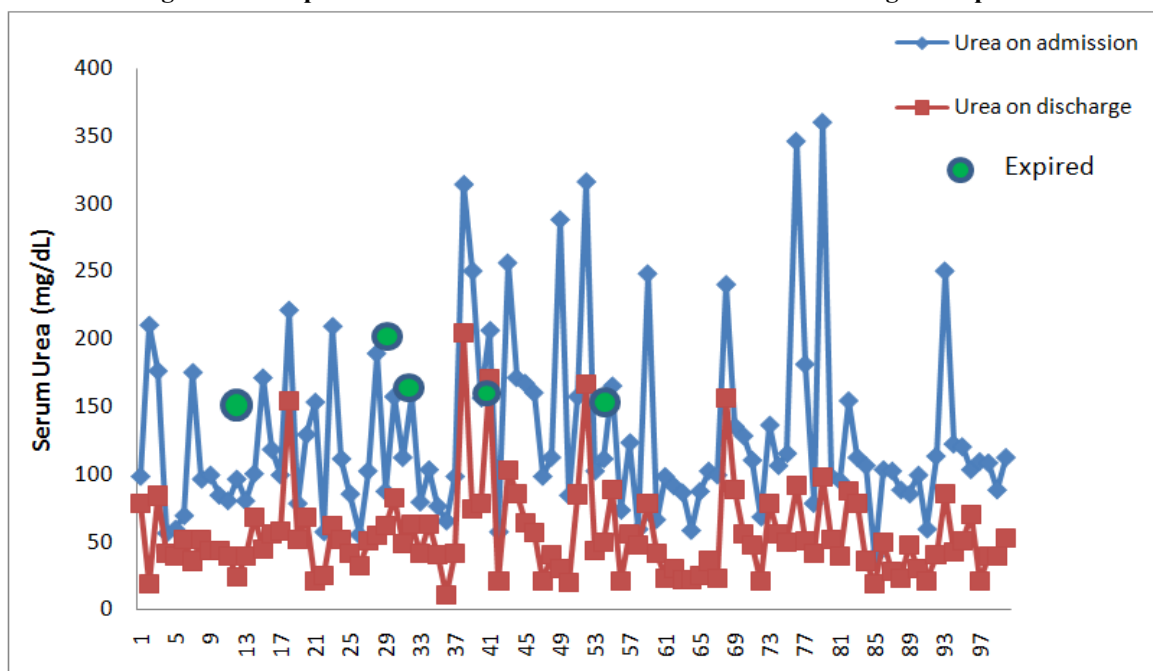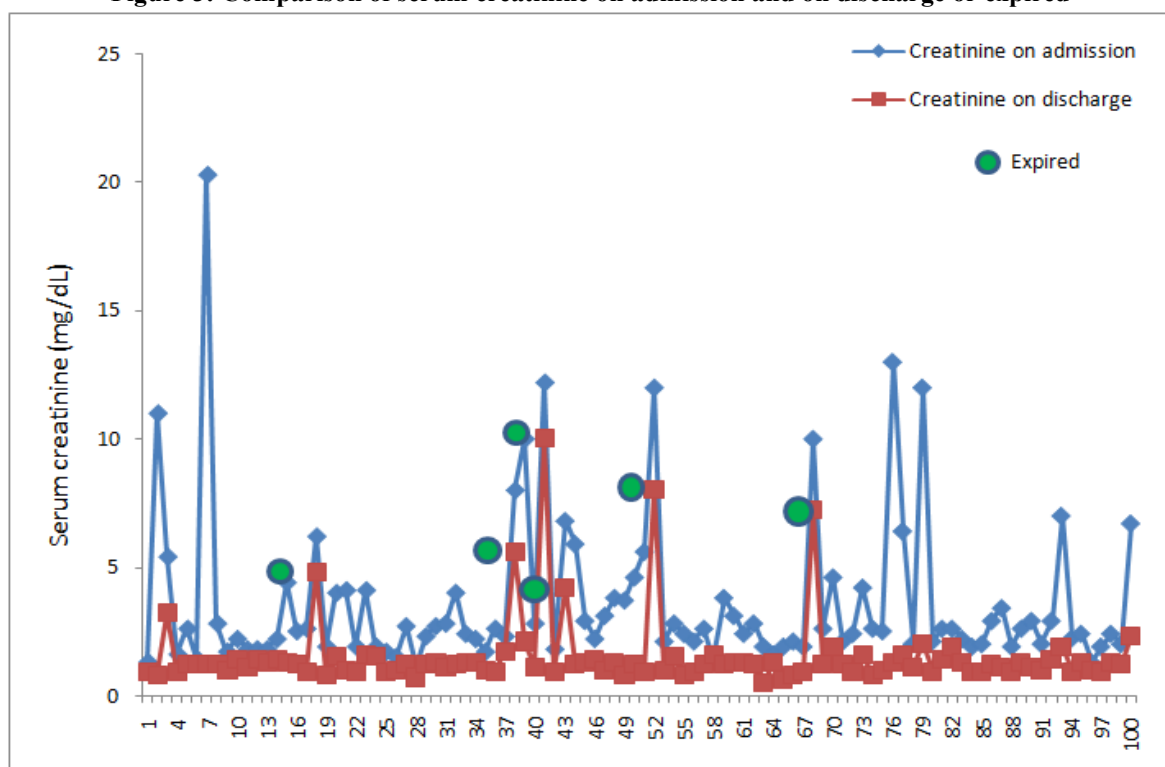

Figure 3: Comparison of serum creatinine on admission and on discharge or expired

Outcome: Out of 100 cases studied, 93 patients survived, mortality was 7 %.

Comorbidity: In our study, incidence of AKI was found to be more common in patients with comorbid illness. Out of 100 patients studied, 51 patients were having associated diseases (DM, HTN, IHD, CCF, COPD, PLHA or cirrhosis)

Association of comorbidity with Outcome: Mortality was seen more among patients with comorbidity suggestive of poor prognosis. Out of 7

patients who expired in the study, 4 were having comorbidity associated with it.

4. Discussion

The observations made in 100 cases of AKI admitted to Sir T Hospital Bhavnagar from June 2013 to July 2014 are discussed and compared with other studies. The study revealed that mean age of patients were on lower side than western studies but comparable with most of Indian studies.

1) Age and sex: In present study, age group of patients with AKI ranged from 20 to 80 years with mean age of 44.5 years, out of which 73% are males and 27% are females. The result are comparable with other studies done by Mataloun *et al*[35], Olaga B *et al*[36] and Picard[37] as tabulated below:

Table 3: Comparison of Age and sex

Study	Male	Female	Mean age group (years)
Picard study[37]	59%	41%	59.5
Mataloun[35]	46.2%	53.8%	55.3
Olaga B[36]	60%	40%	69.6
Present study	73%	27%	44.5

In other study done by Shah *et al*[38] found that maximum numbers of patients are between 12-30 years of age group with mean age of 38.4 years which is again comparable with present study.

2) Clinical symptoms: A study of clinical presentation of patients was done. We noted that vomiting and oliguria were most common symptoms comprising of 81% and 63% respectively. This finding is comparable with other studies done by Liano and Pascual [42] and Eswarappa M [1].

Table 4: Comparison of Clinical symptoms

Clinical symptoms	Present study	Eswarappa M[1]	Liano and Pascual [42]
Vomiting	81%		86%
Oliguria	63%	67%	80%
Fever	61%	52%	-
Edema	37%	28%	-
Jaundice	5%	21%	-
Breathlessness	13%	-	-
Altered sensorium	8%	-	-

Oliguria is also found to be the most common presentation in other studies done by Bagshaw *et al* [39] and Romao junior E *et al* [40].

3) Classification of AKI: In present study, acute kidney injury is classified as prerenal, renal and postrenal according to the etiology. Another classification is on the based on RIFLE criteria. The observations are comparable with studies done by Balushi *et al* [41] and Liano and Pascual [42].

Table 5: The comparison is tabulated below

AKI	Balushi *et al*[41]	Liano and Pascual [42]	Kumar *et al*[33]	Present study
Prerenal	50.9%	21%	20.6%	26%
Renal	44.5%	45%	69.6%	66%
Postrenal	4.6%	10%	9.8%	8%

Most common cause of AKI was found to be renal/ intrinsic. Similar results were found in other studies done by Brivet *et al* [43].

RIFLE classification: In present study, 58% patients were in risk group, 23% in injury group and 17% in failure group which is comparable with other studies done by Eswarappa M [1], Balushi *et al* [41] and Mohan *et al* [44].

Table 6: RIFLE classification

Classification	Risk	Injury	Failure
Mohan G[44]	24%	34%	42%
Eswarappa M[1]	24.4%	37%	35%
Balushi *et al*[41]	19%	35%	46%
Present study	58%	17%	23%

4) Etiology of Aki: In the present study, we have also compared the etiology of AKI. In our study we have noted that most common cause of AKI was septicemia contributing to 44% of cases whereas nephrotoxicity was seen in 6% and malaria in 9% of cases. Comparison is also made with other studies done by Eswarappa M [1] and Shah *et al* [38] Comparison is tabulated below.

Table 7: Etiology of Aki

Etiology	Present study	Eswarappa M[1]	Kumar *et al*[33]
Malaria	9%	6.4%	0.9%
Septicemia	48%	38.6%	32.4%
AGE	11%	10.4%	20.6%
Snakebite	2%	2.6%	4%
CCF	7%	6.8%	-
Cirrhosis	7%	6.0%	-
Nephrotoxicity	6%	-	-
Obstetric causes	2%	-	4.9%

5) Source of sepsis:

Table 8: Comparison with other studies

Source of sepsis	Present study	Shah *et al*[38]	Bagshaw *et al*[39]
Thoracic	4	14	250
Intra-abdominal	3	12	202
Endovascular	2	3	56
Urogenital	17	58	34
Skin/soft tissue/bone	6	14	29
other	8	21	7

6) Comparison of clinical profile of patients

Table 9: Comparison of clinical profile of patients

Parameters	Present study		Shah *et al*[38]		Bagshaw *et al*[39]
	Mean [SD]	P-value	Mean [SD]	P-value	Mean[SD]
Temperature(F)	99.33[0.97]	<0.0001	99.3[1.6]	0.517	-
Pulse(/min)	96.07[12.92]	<0.0001	94.6[13.88]	0.50	98[21]
SBP(mm of Hg)	127.62[16.37]	<0.0001	124.76[22.48]	<0.0001	116[27]
DBP(mm of Hg)	81.96[7.35]	<0.0001	77.09[16.59]	0.0004	-
RR(/min)	19.01[2.73]	<0.0001	23.19[3.06]	0.207	19.5[6.5]
Hb (g %)	10.35[2.02]	<0.0001	8.54[2.42]	0.002	-
TC(x103 /cumm)	19.52[9.073]	<0.0001	22.2[10.7]	0.255	13.4
Urea(mg/dl)	128.18[66.64]	<0.0001	151.19[74.20]	0.035	-
Creatinine(mg/dl)	3.64[3.1]	<0.0001	7.31[3.41]	0.020	-

7) Association of presence of co morbid illness with AKI outcome and prognosis

Table 10: Comparison is tabulated below

Study	No. of patients with co-morbidity
Prakash *et al* [22]	52%
Eswarappa M [1]	61.4%
Kumar *et al*[33]	33.36%
Present study	51%

Table 11: Co morbid illness found in patients

Co morbid illness	Picard[37]	Prakash *et al* [22]	Balushi *et al* [41]	Kumar *et al*[33]	Present study
DM	29%	28.3%	50.9%	1.9%	41.82%
HTN	37%	34.7%	53.7%	3.9%	24.09%
IHD	-	30.4%	50.9%	6.9%	16.36%
Cirrhosis	21%	-	-	-	10.09%
COPD				11.9%	5.45%

8) Management and outcome of disease

In present study of 100 cases 93% patients survived and about 7 percent patients expired. Among 100 cases, 83% patients are managed conservatively and 17% patients underwent hemodialysis. Out of 83% patients managed conservatively 2% died and 17% who underwent hemodialysis 5% died. Good results are obtained with patients on conservative management. Conservative management include prompt diagnosis and initiation of treatment. Patients who died were having septicaemia and associated complications. Comparison with other studies is tabulated below:

Table 12: Management and outcome of disease

Study	Conservative management	Hemodialysis
Eswarappa [1]	62.8%	37.2%%
Liano and Pascual [42]	64%	36%
Present study	83%	17%

The major risk factor affecting prognosis of the patients were presence of multi-organ failure, high baseline serum creatinine level and complication developed during the course of illness.

In the present study, mortality is seen among the patients who had high serum creatinine on admission as compared to survived patients. Prognosis is also found to be poor in patients with co morbid illnesses. Out of 51 patients with co morbidity, mortality is 57% which justifies poor prognosis of patients who develop AKI in presence of co morbid illness. Thus age more than 65 years and presence of co morbidity are poor prognostic indicators of AKI.

4. Conclusions

In this study 100 patients admitted between June 2013 to July 2014 at Sir T hospital, Bhavnagar are observed prospectively. The clinical feature and various etiology of acute kidney injury are studied. It is observed that clinical features are almost in accordance with studies conducted earlier. Oliguria and vomiting are the predominant symptom in acute kidney injury. However, we observed that septicaemia is the predominant cause of acute kidney injury and these patients recovered with conservative management and very few needed hemodialysis. Other causes of acute kidney injury were similar to other studies like drug nephrotoxicity, acute gastroenteritis and septicaemia. About 93% patients survived. 83% patients were on conservative treatment and 17% patients underwent hemodialysis. We observed that early diagnosis and intervention were probably responsible for good survival rate.

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