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A STUDY OF ETIOLOGICAL AND CLINICAL PROFILE OF PATIENTS WITH ACUTE KIDNEY INJURY AND VARIOUS FACTORS ASSOCIATED WITH MORTALITY: A SINGLE CENTRE STUDY

Medicine

Manohar Lal Prasad Associate professor, dept of medicine, Rajendra institute of medical sciences, ranchi - 834009

Prajit Mazumdar* Junior resident ,dept of medicine, Rajendra institute of medical sciences, ranchi -834009 *Corresponding Author

Divakar Kumar Senor resident ,dept of medicine, Rajendra institute of medical sciences, ranchi -834009

Malyaban Das Junior resident ,dept of medicine, Rajendra institute of medical sciences, ranchi -834009

ABSTRACT

Introduction: Acute kidney injury due to any cause is associated with major inpatient morbidity and mortality. AKI complicates nearly 5% of the hospital admissions and up to 30% of ICU admissions

Materials and methods: We did a cross sectional descriptive study conducted on 60 patients admitted with a diagnosis of acute kidney injury in the department of medicine and dialysis unit of Rajendra Institute of medical sciences, Ranchi between January 2018 to July 2018

Results: Out of total 60 patients, 24 patients died and 36 patients survived. Patients in the age group of > 70 years had comparatively higher mortality rates (66.7%).

Out of 60 cases studied, 45 were due to medical causes, rest due to surgical and obstetric causes. Among the 45 cases of medical causes, complicated malaria was most common accounting for 24 cases (53.5% of medical causes) followed by snake bite. Among the causes of acute kidney injury, complicated malaria was the major cause leading to mortality.

Out of 60 patients for hemodialysis was done for 24 (40 %) AKI cases. The remaining 36 cases were treated conservatively. There was significant mortalty in patients undergoining hmd . 16 out of 24 patients undergoining haemodialysis died (66.7%) as compared to conservative treatment group.

24 out of 60 patients had various comorbid conditions and risk factors -most common was diabetes mellitus followed by hypertension and ischemic heart disease .There was significant increase in mortality (66.7%) in patients with comorbid conditions as compared to those without it.

There is a highly significant ($p<0.001$) difference in the outcome pattern of acute kidney injury patients who are having hyperkalemia when compared to those who are normokalemic and those having dearranged urea and ceratinine at admission.

Conclusion: Patients in the age group of > 70 years had comparatively higher mortality rates . Out of 60 cases studied, complicated malaria accounted for majority of cases followed by snake bite and higher mortality was seen in the malaria group as compared to other causes which can be attributed to the fact that Jharkhand is a malaria endemic zone and hence early treatment with antimalarials should be given to decrease the incidence of AKI. Patients with hyperkalemia, comorbid conditions and dearranged urea and ceratinine at admission had higher mortalty rates .

KEYWORDS

Acute Kidney Injury(A.K.I), Haemodialysis, Malaria, Snake Bite

INTRODUCTION

Acute kidney injury due to any cause is associated with major inpatient morbidity and mortality. AKI complicates nearly 5% of the hospital admissions and up to 30% of ICU admissions. In most of the cases it is potentially reversible, if recognized early and managed appropriately at a right time. The present study to analyze the clinical profile of acute kidney injury in a tertiary hospital and comparsion of various factors affecting the mortality rates in patients with acute kidney injury.

MATERIALS AND METHODS

Site of study-Ours is a cross sectional descriptive study conducted on 60 patients admitted with a diagnosis of acute kidney injury in the department of medicine and dialysis unit of Rajendra Institute of medical sciences, Ranchi between January 2018 to July 2018

Study population-Patients who met the inclusion criteria were selected randomly and no distinction was made between males and females.

Inclusion Criteria-

Patients >15yrs who satisfy any one of the following criteria were included in the study----

1) Increase in S.Cr >50% from baseline which is known or presumed to have occurred within the prior 7 days; or >0.3mg /dl increase in ceratinine over 48 hours
2) Urine volume <0.5 ml/kg/hr for 6 hours

Exclusion Criteria—

1. Patients aged less than 15 years.
2. Patients with previous renal disease.
3. Patients with previous renal transplantation.
4. Patients with evidence of contracted kidneys on ultrasound scan abdomen.

Patients were followed clinically and by serial biochemical tests which are tabulated on day 1 on the day of admission, after 48 hours and day 7 and on the day of discharge. They were managed conservatively, if indicated hemodialysis was done.

Indications for HD in my study include anuria, refractory hyperkalemia, refractory metabolic acidosis, pulmonary oedema and various uraemic conditions like ureamic pericarditis, uremic gastritis and encephalopathy. Based on outcome, AKI patients are divided as improved (I) whose renal function completely improved without any residual defects, and died as those who didn't survive.

Microsoft excel was used for data plotting and SPSS v.22 was used for data analysis.

RESULTS

Ours is a cross sectional descriptive study conducted on 60 patients admitted with a diagnosis of acute kidney injury.

Out of total 60 patients, 24 patients died and 36 patients survived.

- **Age of patients**

About 18 patients out of 60 (30%) of patients with acute kidney injury were <40 yrs, 18 patients(30%) between 40-70 years and 24 patient (40%) above 70 years. In our study youngest AKI patient age was 18yrs and eldest AKI patient age was 80yrs. Patients in the age group of > 70 years had comparatively higher mortality rates(66.7%) and contribute of total deaths due to acute kidney injury(Table-1) and this association was statistically significant (P value-0.002) . This can be due to the severity of primary illness leading to acute kidney injury and due to increased comorbid conditions associated with increasing age

TABLE 1-relation of age in with death patients of AKI

age * outcome Crosstabulation			
	outcome		Total
	competely recovered	death	

age	<40 yrs	Count	14	4	18
		% within outcome	38.9%	16.7%	30.0%
	40-70 yrs	Count	14	4	18
		% within outcome	38.9%	16.7%	30.0%
	>70 yrs	Count	8	16	24
		% within outcome	22.2%	66.7%	40.0%
Total		Count	36	24	60
		% within outcome	100.0%	100.0%	100.0%

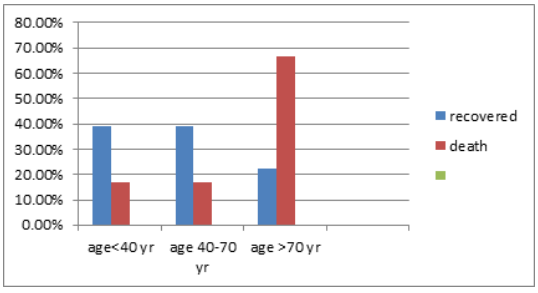


TABLE 1-relation Of Age With Death In Patients of AKI

- **Comorbid Conditions of Patients Studied**

24 out of 60 patients had various comorbid conditions and risk factors -most common was diabetes mellitus followed by hypertension and ischemic heart disease .There was significant increase (P value-0.002) in mortality (Table 2) in patients with comorbid conditions as compared to those without it.

TABLE 2-Relation Of Comorbid Conditions With Death In Patients Of Aki

comorbid_conditions * outcome Crosstabulation				
			outcome	
			competely recovered	death
comorbid_conditions	comorbid condition present	Count	8	16
		% within outcome	22.2%	66.7%
	comorbid condition absent	Count	28	8
		% within outcome	77.8%	33.3%
Total		Count	36	24
		% within outcome	100.0%	100.0%

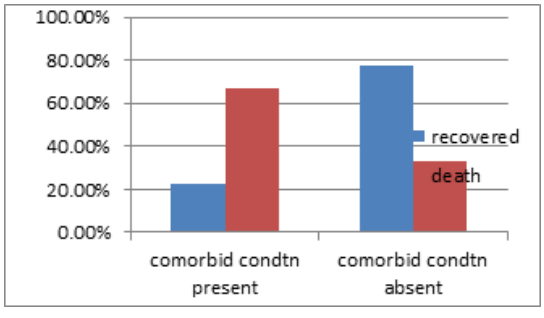


TABLE 2-Relation Of Comorbid Conditions With Death In Patients Of Aki

- **Causes of Acute Kidney Injury**

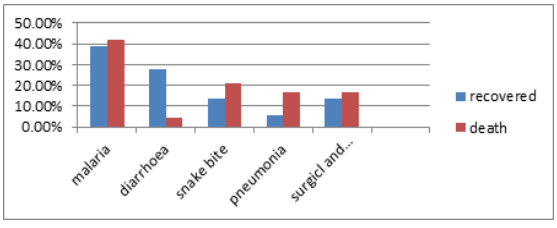
The causes were divided into those due to medical, surgical and obstetric causes. Out of 60 cases studied, 45 were due to medical causes, rest due to surgical and obstetric causes. Among the 45 cases of medical causes, complicated malaria was most common accounting for 24 cases (53.5% of medical causes) followed by snake bite 10 patients (22.22% out of 45 medical causes) and 11 patients of acute gastroenteritis and 6 patients of pneumonia .

Surgical and obstetric causes comprised of the remaining 15 patients.

Among the causes of acute kidney injury, complicated malaria was the major cause leading to mortality (Table 3) . Out of the total 24 cases due to severe malaria 10 patients(41.7%) died . The risk factor being the severity of malaria itself with its complication like pneumonia, septic shock, multi organ dysfunction and cerebral malaria.

TABLE 3-relation of causes with death in patients of AKI

causes * outcome Crosstabulation					
			outcome		Total
			competely recovered	death	
causes	malaria	Count	14	10	24
		% within outcome	38.9%	41.7%	40.0%
	diarhhoea	Count	10	1	11
		% within outcome	27.8%	4.2%	18.3%
	snake bite	Count	5	5	10
		% within outcome	13.9%	20.8%	16.7%
	pneumonia	Count	2	4	6
		% within outcome	5.6%	16.7%	10.0%
	surgical and obs causes causes	Count	5	4	9
		% within outcome	13.9%	16.7%	15.0%
Total		Count	36	24	60
		% within outcome	100.0%	100.0%	100.0%



- **Treatment Modalities for Acute Kidney Injury**

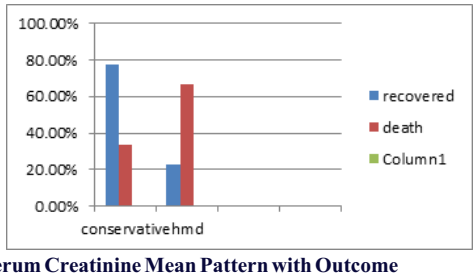
The AKI cases with anuria, hyperkalemia, pulmonary oedema, uremic encephalopathy were taken up for hemodialysis which constitute 24 out of 60 (40 %) AKI cases. The remaining 36 cases were treated conservatively and followed for improvement in renal functions.

There was sigmificant mortalty in patients (Table 4) undergoining hmd . 16 out of 24 patients undergoining haemodialysis died (66.7%) as compared to conservative treatment group where 33.3% patient died and this association was statistically significant(P value< 0.01).

TABLE 4 -Relation of treatment modalities with death in patients of AKI

treatment * outcome Crosstabulation					
			outcome		Total
			competely recovered	death	
treatment	conservative	Count	28	8	36
		% within outcome	77.8%	33.3%	60.0%
	hmd	Count	8	16	24
		% within outcome	22.2%	66.7%	40.0%
Total		Count	36	24	60
		% within outcome	100.0%	100.0%	100.0%

TABLE 4 -relation of treatment modalities with death in patients of AKI



- **Serum Creatinine Mean Pattern with Outcome**

In the present study mortality was high in the acute kidney injury

patients who had serum urea and ceratinine deaaranged during time of admission (66.7%) when compared to those having normal blood urea and ceratinine at time of admission (33.7%) and this difference is statistically significant(P value<0.001) with low p-values

TABLE 5-relation of dearranged rft at admission with death in patients of AKI

rft * outcome Crosstabulation					
			outcome		Total
			competely recovered	death	
rft	deaaranged rft at admission	Count	4	16	20
		% within outcome	11.1%	66.7%	33.3%
	normal rft at admission	Count	32	8	40
		% within outcome	88.9%	33.3%	66.7%
Total		Count	36	24	60
		% within outcome	100.0%	100.0%	100.0%

- **Association of Hyperkalemia with Outcome**

There is a highly significant (p<0.001) difference in the outcome pattern of acute kidney injury patients who are having hyperkalemia when compared to those who are normokalemic.

TABLE 6 -relation of hyperkalemia with death in patients of AKI

hyperkalemia * outcome Crosstabulation					
			outcome		Total
			competely recovered	death	
hyperkalemia	hyperkal present	Count	5	16	21
		% within outcome	13.9%	66.7%	35.0%
	hyperkal absent	Count	31	8	39
		% within outcome	86.1%	33.3%	65.0%
Total		Count	36	24	60
		% within outcome	100.0%	100.0%	100.0%

DISCUSSION

A total of 60 patients with acute kidney injury were analysed. Out of total 60 patients, 24 patients died(40% death) and 36 patients survived. This is in contrast to study done by Mathur A et al[1] who found 71% of AKI cases recovered completely and only 20% died.

In our study youngest AKI patient age was 18yrs and eldest AKI patient age was 80yrs. Patients in the age group of > 70 years had comparatively higher mortality rates(66.7%) most probably due to the severity of primary illness leading to acute kidney injury and due to increased comorbid conditions associated with increasing age.

A comparative study of the causes revealed , complicated malaria was most common accounting for 24 cases (53.5% of medical causes) followed by snake bite 10 patients (22.22% out of 45 medical causes) and 11 patients of acute gastroenteritis and 6 patients of pneumonia .Surgical and obstetric causes comprised of the remaining 15 patients .

Among the causes of acute kidney injury, complicated malaria was the major cause leading to mortality(41.7%) died . This could be attributed as Jharkhand is a malaria endemic zone and the risk factors being the severity of malaria itself with its complication like pneumonia, septic shock, multi organ dysfunction and cerebral malaria.

Similar findings of high incidence of malaria as a common cause of acute kidney injury was also observed in other Indian studies like Singhal AS et al [2](16%) and Prakash J et al[3] (15%). This is however different as compared to other studies like Sirwal IA et al[4] in the ―Profile of acute renal failure in Kashmir valley‖ where they found the leading cause was that due to Acute gastroenteritis accounting for 26.2% of cases and a study by Ramachandran.S et al[5] in Sri lanka from Colombo where the leading cause was that due to snake bite. Bernieh B et al[6]

found septicemia as a cause of AKI in 58% of cases.

In our study out of 60 cases of AKI, 36 cases were treated conservatively and 24 cases underwent haemodialysis. Patients undergoining haemodialysis had significant mortality rate (66.7%) than those undergoining conservative treatment. Among 24 cases who underwent haemodialysis >50% cases not died. This may be due to the severity of AKI itself or due to complications of haemodialysis. This is comparable to study by Nevu H et al[7] and Hakim AL et al[8], who found that mortality was higher in dialysed than non dialysed ARF cases.

There is a high mortality in the outcome pattern of patients with acute kidney injury who are hyperkalemic (66.7% death)compared to normokalemic patients

CONCLUSION

The present study is a cross sectional study which included 60 patients admitted with acute kidney injury in Department of Medicine. Patients in the age group of > 70 years had comparatively higher mortality rates . Out of 60 cases studied, majority of cases with AKI were due to medical causes. Among the medical causes of AKI, complicated malaria accounted for majority of cases followed by snake bite and higher mortality was seen in the malaria group as compared to other causes which can be attributed to the fact that Jharkhand is a malaria endemic zone and hence early treatment with antimalarials should be given to decrease the incidence of AKI. Patients with hyperkalemia, comorbid conditions and dearranged urea and ceratinine at admission had higher mortalty .

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