IOSR Journal Of Pharmacy www.iosrphr.org
(e)-ISSN: 2250-3013, (p)-ISSN: 2319-4219
Volume 9, Issue 1 Version. I (January 2019), PP. 34-37

Incidence of AKI with or without hemodialysis in tribal population of Chhattisgarh

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ABSTRACT: The information regarding the incidence of acute kidney injury (AKI) with or without haemodialysis in tribal population of Chhattisgarh is limited. The aim of the study was to find the incidence, prognostic factors, and outcome of patients with AKI. We also assessed whether only urine output criteria of risk, injury, failure, loss, end (RIFLE) classification can be used to look at the outcome of AKI. Acute kidney injury (AKI) is a common clinical problem in the community and especially in critically ill patients and is associated with an increase in morbidity and mortality, reduction in glomerular filtration rate (GFR) over a short time period, is a common and severe complication in patients with cirrhosis and is often triggered by a precipitating event (i.e. overdose of diuretics, large-volume paracentesis without albumin replacement, gastrointestinal bleeding, bacterial infections, Better classification of renal failure by the risk, injury, failure, loss, end stage (RIFLE), and Acute Kidney Injury Network (AKIN) guidelines has made the reports more standardized. The incidence of AKI is associated with mortality as high as 45–50%, with dialysis dependence, with reduced quality of life, and with excess utilization of health resources. All patients underwent HD. Based on our study, prediction of the requirement of RRT-based on admission values of bilirubin, sepsis, and metabolic acidosis does not seem to be valid. Only creatinine on admission, increasing age, APACHE II, SOFA score, and use of noradrenaline were significantly associated with the requirement of HD in multivariate analysis. The incidence of AKI was 12.35% in critically ill patients. In patients with AKI, 29.03% patients required HD and 28 day mortality was 58.06%. AKI patients with septic shock with vasopressors have a higher requirement of RRT, especially as age increases

KEYWORDS: Acute Kidney Injury(Aki) Haemodialysis(Hd) Incidence, Mortality

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Date of Submission: 05-01-2019 Date of acceptance: 21-01-2019

I. INTRODUCTION

Acute kidney injury (AKI) is a common clinical problem in the community and especially in critically ill patients and is associated with an increase in morbidity and mortality(1). It is a clinical manifestation of several disorders that affect the kidney acutely characterized by the rapid loss of the kidneys excretory function and is typically diagnosed by the accumulation of end products of nitrogen metabolism (2). The incidence of community-acquired AKI reported in India was 4.14/1000 admissions in 1996–2008 with a mortality of 10.98%(2). Incidence and outcomes of AKI are well known for hospitalized patients(3) specific aspects of community-acquired AKI in poor regions, like diarrheal diseases, leptospirosis, dengue, animal venoms, obstetric complications (4)(5) Acute kidney injury (AKI), defined by a significant reduction in glomerular filtration rate (GFR) over a short time period, is a common and severe complication in patients with cirrhosis and is often triggered by a precipitating event (i.e. overdose of diuretics, large-volume paracentesis without albumin replacement, gastrointestinal bleeding, bacterial infections, etc.)(10) effective pharmacologic therapies for AKI, its management remains supportive, focused on optimizing fluid balance, maintaining nutrition, preventing or treating electrolyte and acid-base disturbances, adjusting the dosing of medications that are excreted by the kidney, and avoiding secondary hemodynamic and nephrotoxic renal injury .renal replacement therapy using one or more of the multiple modalities of dialysis and hemofiltration is often required(6) To initiate Renal Replacement Therapy in patients with AKI has been debated nearly as long as hemodialysis has been part of the armamentarium of clinical medicine. In 1960, in their seminal article on prophylactic dialysis in acute kidney injury, Paul Teschan and colleagues wrote:

"While there is increasing recognition of the value of earlier dialysis, the published consensus, and the practice in many centers at present, is still to apply dialysis to relatively ill rather than to relatively healthy patients. This is implied by the usually quoted indications for dialysis, namely, definite or progressive clinical uremic illness and/or progressive potassium intoxication, occurring despite careful suppressive therapy."(7)

Better classification of renal failure by the risk, injury, failure, loss, end stage (RIFLE), and Acute Kidney Injury Network (AKIN) guidelines has made the reports more standardized. The incidence of AKI is associated with mortality as high as 45–50%, with dialysis dependence, with reduced quality of life, and with excess utilization of health resources.

Aim of study

The aim of this study was to analyze the incidence, prognostic factors of AKI Objectives
To find the incidence of AKI in critically ill patients in our center
To assess the outcome of AKI with requirement of hemodialysis (HD).
To assess the ability of 24 h RIFLE classification to prognosticate AKI.

II. METHOLOGY

A Cross sectional study was conducted to assess the incidence of acute kidney injury (AKI) with haemodialysis or without haemodialysis, admitted in the department of medicine, between month of June to August, 2018 in Dr.Bhim Rao Ambedkar hospital Riapur C.G. with total 251 patients. Only 31 with acute kidney injury a mixture of urban and rural population admitted were included for study. Ethical clearance has taken from the ethical committee of the Pt.JNM Medical college Raipur, prior to conduct the study . All participants and family members of the patients were provided written informed consent. An approved pre – structured tools or format was used to collect the information that include the information that include basic parameters age, sex, DM, Hb, TLC, DLC, ESR, CRP, Urea, Creatinine, sodium, potassium ,U<R/M, Thyroid, no. of dialysis, site of center line for HD, U<C/S, X-RAY Chest ,Echocardiography & USG abdomen etc.

We conduct this study taking, various parameters as indicator of incidence of AKI patients which include reading of urine output, creatinine level, and urea, and sodium, potassium level. Staging of diseases has been classified by RIFLE (risk, injury, failure, loss and end stage). Data was collected by using indirect method and was entered and analyzed by using Microsoft excel.

The acute illness of the patient was classified as cardiovascular, respiratory, gastrointestinal, renal, or neurological. We also classified the patients according to maximum RIFLE class in the first 24 h of inclusion in the study. We used the urine output criteria for the classification according to AKI-KDIGO criteria.

CLASS	URINE OUTPUT	GFR
R	<0.5ML/KG/H FOR 6 HOURS	SERUM CREATININE 1.5 MG/DL
I	<0.5ML/KG/H FOR 12 HOURS	SERUM CREATININE 2.0MG/DL
F	<0.3ML/KG/H FOR 24 HOURS OR ANURIA FOR 12 HOURS	SERUM CREATININE 32MG/DL OR 4.0 WITH ACUTE RISE> 5 MG/DL
L	COMPLETELY LOSS OF KIDNEY	FUNCTION >4 WEEKS
E	ESRD > 3 MONTHS	

ESRD -END STAGE RENAL DISEASES , GFR-GLOMERULAR FILTRATION RATE
RIFLE-RISK,INJURY,FAILURE,LOSS,END

The presence of sepsis and septic shock, requirement of mechanical ventilation (MV), or vasopressors was recorded. HD is the only method used for support of patients with loss of renal function in our center. The patients were followed up for 28 days from admission. Outcomes looked at were 28 days mortality and requirement of HD in AKI. Statistical analysis was done using SPSS 14 (SPSS Inc., Chicago, IL, USA). Continuous variables were presented as mean (±standard deviation).

III. RESULTS

After excluding patients with ESRD and patients under 18 years of age, we collected data of 251patients. Out of these 251 patients, 31 had AKI. The crude incidence of AKI was 12.35%, and mortality was 58.06% (showed in figure.1) it was found that 9(29.03%) were on renal replacement therapy

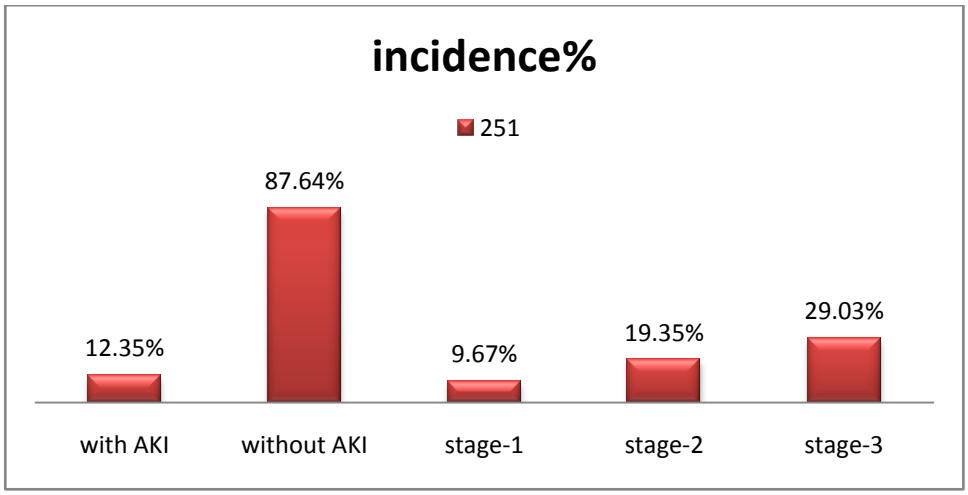

Figure. 1 relationship between incidence of acute kidney injury and stage according to AKI-KDIGO

Variable	Percentage (n=31)
Age	46.64
Male	54.83%
Hypertension	80.64%
Diabetes mellitus	3.22%
Renal paranchymal diseases	35.48%
b/l pleural effuision	19.35%
BPH prostate megaly	3.22%
Fatty liver	0.31%
Hepatitis B	0.31%
hydronephritis	0.93%
Leukocyte (mean)	12.02

Clinical characteristics of the population of patients of acute kidney injury(showed in figure.2)

The average age of the patient with AKI was 46.64 ± 14.69. 54.83% were males. The average stay in hospital was 11.0 ± 8.5 days.. Comorbidities of the patients were recorded and diabetes mellitus (16.12%) was the most common. The clinical features and biochemical values on the admission of the AKI patients are mentioned. In this study, 14 (45.16%) patients had sepsis, 71.3% patients had metabolic acidosis and 32.25% patients were in shock on admission.

variable	mean±SD
sepsis	12.02±5.83
creatinine	5.27±2.82
Sodium	131.87±4.115
Urea	126.48±50.37
potassium	04.06±0.906
Hemoglobin	8.87±1.983

Figure;3 Characteristics of patients with AKI on admission

Pearson Chi-square analysis showed a significant difference between the R, I, and F groups. The percentage of mortality in these three groups did not show a significant difference in our study

Class	N0.of patients(%)	RRT required(%)	Mortality(%)
R	3(9.67)	0	0
I	6(19.35)	50	66.66
F	9(29.03)	66.66	88.88

Figure.4 RIFLE class and outcome of AKI patients

IV. DISCUSSION

The AKI is often of multifactorial etiology, but it is known to increase mortality, It alters the outcome of patients, especially those requiring Renal replacement theory (8) Indications for RRT included metabolic acidosis, hyperkalemia, uremia, and control of volume status. (9) All patients underwent HD. Based on our study, prediction of the requirement of RRT-based on admission values of bilirubin, sepsis, and metabolic acidosis does not seem to be valid. Only creatinine on admission, increasing age, APACHE II, SOFA score, and use of noradrenaline were significantly associated with the requirement of HD in multivariate analysis. Urine output may be a better way to assess the renal status, and it has the additional advantage that it is the same in both criteria. The management of patients with acute kidney injury (AKI) is supportive, with renal replacement therapy (RRT) indicated in patients with severe kidney injury. Multiple modalities of RRT are available. Patients with haemodialysis are prone to a variety of infections. Infection results in increased mortality and morbidity among patients in pre dialysis stages, in which debility due to uremic state increases the risk of infection. The risk can be nullify by prescription of hemodialysis to reduce uremic condition but it further predisposes other culprit that leads to occurrence of infection(11)

Limitations of the study

This was a single-center, prospective study of only 6 months duration. The follow-up period is too short to know whether the kidneys have recovered or if the patients required longterm RRT. The AKI in postoperative patients have not been included in the study as ours was a medical ICU. A larger multicenter study can provide a more significant association between urine output criteria of RIFLE and outcome of AKI.

V. CONCLUSION

The incidence of AKI was 12.35% in critically ill patients. In patients with AKI, 29.03% patients required HD and 28 day mortality was 58.06%. AKI patients with septic shock with vasopressors have a higher requirement of RRT, especially as age increases. Underlying chronic illness such as hypertension and CKD, need for MV, vasopressor support, and RRT are associated with increased 28 days mortality in AKI. The positive univariate association of urine output criteria of RIFLE classification with the requirement of HD in AKI patients warrants further research

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