ISSN- O: 2458 - 868X, ISSN–P: 2458 – 8687
National Library of Medicine - ID: 101731606

International Journal of Medical Science and Innovative Research (IJMSIR)
IJMSIR : A Medical Publication Hub
Available Online at: www.ijmsir.com
Volume – 11, Issue – 3, June – 2026, Page No. : 29 – 40

Clinical Profile and Outcomes of Acute Kidney Injury: A Cross-Sectional Study in the ICU of a Tertiary Care Centre in Central India

[1]Dr Rashmi Nagdeve, MD Medicine, Associate Professor, Department of General Medicine, Government Medical College, Nagpur

[2]Dr Teena Gupta, DNB Medicine, Assistant professor, Department of General Medicine, Government Medical College, Nagpur

[3]Dr Milind Burile, MD Medicine, Senior Resident, Department of General Medicine, Indira Gandhi Government Medical College, Nagpur

Corresponding Author: Dr Teena Gupta, DNB Medicine, Assistant Professor, Department of General Medicine, Government Medical College, Nagpur

Citation this Article: Dr Rashmi Nagdeve, Dr Teena Gupta, Dr Milind Burile, "Clinical Profile and Outcomes of Acute Kidney Injury: A Cross-Sectional Study in the ICU of a Tertiary Care Centre in Central India", IJMSIR – June – 2026, Vol – 11, Issue – 3, P. No. 29 – 40.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Background: Acute kidney injury (AKI) is a common and serious complication among critically ill patients admitted to intensive care units, contributing significantly to morbidity and mortality. Aim of the study was to assess clinical profile and outcomes of patients with acute kidney injury in ICU setting.

Methods: This cross-sectional study was conducted among 120 patients aged >18 years diagnosed with AKI according to KDIGO criteria. Demographic details, clinical profile, laboratory investigations, comorbidities, etiologies, treatment modalities, and outcomes were recorded. Serial measurements of serum creatinine, blood urea, and urine output were obtained from admission until discharge or death.

Results: The mean age of the participants was 48.75±14.41 years, and females constituted 50.8% of the cases. Renal AKI was the most common type (69.2%), while Stage III AKI was observed in 65.0% of participants. Cardiogenic shock (15.0%), drug-induced nephrotoxicity (12.5%), and viral haemorrhagic fever (10.0%) were the leading etiologies. Proteinuria was present in 27.5% and metabolic acidosis in 12.5% of patients. Significant improvement was observed in serum creatinine, blood urea, and urine output from admission to discharge ($p<0.001$). Hemodialysis was required in 37.5% of patients, with oliguria being the most common indication. Overall, 75.0% achieved full recovery, 15.0% had partial recovery, and mortality was 10.0%. Outcomes were significantly associated

with AKI etiology and need for haemodialysis ($p<0.001$).

Conclusion: Renal AKI and Stage III disease were predominant among ICU patients. Early diagnosis, timely management, and appropriate renal replacement therapy significantly influenced recovery and survival outcomes.

Keywords: Acute kidney injury, ICU, Haemodialysis, KDIGO criteria, Renal failure, Nephrotoxicity

Introduction

Acute kidney injury (AKI), formerly known as acute renal failure, is a condition in which nitrogenous and other waste products are retained due to sudden impairment of renal function. It is commonly seen in critically ill ICU patients and is associated with high morbidity and mortality. The incidence and outcomes of AKI vary globally, with more than 85% of the disease burden occurring in developing countries, while AKI-associated mortality rates are higher in developed countries.[1,2]

AKI is defined by any of the following criteria, per the KDIGO 2012 guidelines: a minimum 0.3 mg/dl (or 26.5 μmol/l) increase in serum creatinine within 48 hours; a minimum 1.5-fold increase in serum creatinine above the baseline value, with the baseline being known or assumed to have occurred within the preceding seven days; or less than 0.5 ml/kg/hr of urine for more than six hours.[3] The stages of AKI are classified into three categories based on serum creatinine levels and urine output.

1. Stage 1 AKI is defined by an increase in serum creatinine to 1.5–1.9 times the baseline value or an absolute rise of ≥0.3 mg/dL, along with urine output of less than 0.5 mL/kg/hour for 6–12 hours.
2. Stage 2 AKI is characterized by serum creatinine rising to 2.0–2.9 times the baseline and urine output remaining below 0.5 mL/kg/hour for 12 hours or more.
3. Stage 3 AKI represents severe kidney injury, with serum creatinine increasing to 3 times the baseline or reaching ≥4.0 mg/dL, initiation of renal replacement therapy, or reduction of eGFR to <35 mL/min/1.73 m² in patients younger than 18 years. Urine output criteria for Stage 3 include less than 0.3 mL/kg/hour for 24 hours or anuria for at least 12 hours.[3]

The causes of AKI are broadly classified into pre-renal, renal, and post-renal categories. Pre-renal causes mainly result from reduced kidney perfusion such as shock, heart failure, and certain medications. Renal causes include infections, sepsis, nephrotoxic drugs, autoimmune diseases, and tubular or interstitial injury. Post-renal causes are mainly due to urinary tract obstruction, including ureteral, bladder, or urethral blockage.[4]

The higher incidence of AKI in developing countries like India is mainly due to community-acquired AKI, which commonly affects younger patients without major comorbidities and is often reversible, resulting in lower mortality. In contrast, developed countries report higher mortality due to hospital-acquired AKI among elderly patients with multiple comorbidities.[2,5,6] In India, limited multicentric data, underreporting of hospital-acquired AKI, and

regional variations in epidemiology restrict the generalization of findings.[7,8] Therefore, this study was conducted to evaluate the clinical profile, etiologies, treatment modalities, and outcomes of patients with acute kidney injury.

Materials and Methods

The present observational cross-sectional study was conducted in the ICU of a tertiary care centre in Central India over a period of two years. Ethical approval was obtained from the Institutional Review Board before initiating the study, and written informed consent was obtained from all participants. A total of 120 patients aged >18 years diagnosed with AKI according to KDIGO classification were included in the study. All patients admitted to the ICU with AKI or those who developed AKI during hospital stay were enrolled. Patients aged <18 years, those diagnosed with chronic kidney disease (CKD) with or without renal replacement therapy, and cases with decreased urine output for more than three months were excluded from the study.

Data was collected in a case record format. Demographic data, medical history, past medical history, including risk factors and comorbidities, were collected. Blood investigations like S. Urea, S. Creatinine, and urine output were obtained on admission and at 12, 24, 48 hours, and at the time of discharge or death. Serum creatinine was measured using the modified Jaffe reaction initial rate assay. Blood urea was measured using the GIDH kinetic method. All subjects were underwent routine investigation like CBC, LFT, ABG, USG, 2D echo. Each patient was looked for the complications of AKI, such as fluid overload, hypertension, electrolyte abnormalities, metabolic acidosis, uremic complications, bleeding, neurological abnormalities, and infections. Treatment and RRT was initiated as and when required according to standard protocol.

Statistical Analysis

The data are tabulated in Microsoft excel and analysed with SPSS V.24 software. The continuous variables were presented with mean and standard deviation. The categorical variables were presented with frequency and percentage. Repeated measures ANOVA and chi square test was used for the statistical analysis. The p value ≤ 0.05 was considered statistically significant.

Observations and Results

The majority of study participants belonged to the age group of 30–60 years (60.0%) with a slight female predominance (50.8%). Most participants were farmers (40.0%) and from rural areas (68.3%). Married individuals constituted 84.2% of the study population, and Hindu religion was predominant (92.5%). Fever was the most common presenting symptom (51.7%), followed by other symptoms (38.3%), breathlessness (31.7%), and decreased urine output (30.8%). Most participants had no history of habit or drug use (69.2%), while drug use (10.0%) and smoking (9.2%) were reported in a smaller proportion. Regarding comorbidities, 59.2% of participants had no associated comorbidity, whereas hypertension with diabetes mellitus was the most common comorbid condition (10.0%), (Table 1).

Table 1: Baseline characteristics of the study participants (n = 120)

Characteristics		Frequency	Percent
Age group (Years)	<30 years	16	13.3%
	30–60 years	72	60.0%
	>60 years	32	26.7%
Gender	Female	61	50.8%
	Male	59	49.2%
Occupation	Clerk	03	2.5%
	Farmer	48	40.0%
	Housewife	36	30.0%
	Labourer	18	15.0%
	Student	09	7.5%
	Teacher	05	4.2%
	Welder	01	0.8%
Urban/Rural	Rural	82	68.3%
	Urban	38	31.7%
Marital status	Married	101	84.2%
	Unmarried	19	15.8%
Religion	Hindu	111	92.5%
	Muslim	04	3.3%
	Buddhist	04	3.3%
	Christian	01	0.8%
Symptoms	Fever	62	51.7%
	Burning micturition	09	7.5%
	Decrease urine output	37	30.8%
	Breathlessness	38	31.7%
	Altered sensorium	18	15.0%
	Others	46	38.3%
Habit/Drug	Alcohol	09	7.5%
	Alcohol, smoking	05	4.2%
	Smoking	11	9.2%
	Drug	12	10.0%

Comorbidities	DM	09	7.5%
	HIV	04	3.3%
	HTN	08	6.7%
	HTN, COPD	04	3.3%
	HTN, DM	12	10.0%
	HTN, DM, IHD	04	3.3%
	IHD	01	0.8%
	Psychiatric illness	03	2.5%
	Thalassemia	04	3.3%

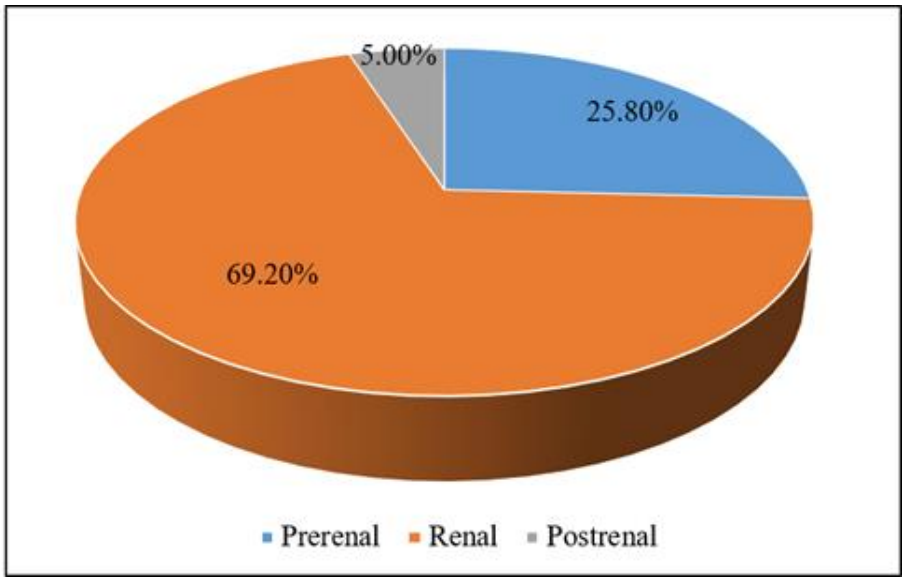
Cardiogenic shock was the most common etiology, affecting 18 participants (15.0%), followed by drug-induced causes in 15 participants (12.5%), and viral hemorrhagic fever in 12 participants (10.0%). Other etiologies such as acute gastroenteritis, lower respiratory tract infection (LRTI), and others show varying frequencies as shown in table 2.

Table 2: Distribution of etiology among study participants

Etiology	Frequency	Percent
Chronic liver disease	03	2.50%
Dehydration with metabolic encephalopathy	03	2.50%
LRTI with UTI	03	2.50%
SLE	03	2.50%
Acute pancreatitis	06	5.00%
Bacterial meningitis	06	5.00%
Obstructive uropathy	06	5.00%
Acute gastroenteritis	09	7.50%
LRTI	09	7.50%
Puerperal sepsis	09	7.50%
Snake bite	09	7.50%
Urinary tract infection	09	7.50%
Viral haemorrhagic fever	12	10.00%
Drug induced	15	12.50%
Cardiogenic shock	18	15.00%

Renal AKI was the most common type observed among the study participants, accounting for 69.2% of cases as depicted in figure 1. Out of 120 participants, 87 participants (72.5%) tested negative for proteinuria, while 33 participants (27.5%) tested positive.

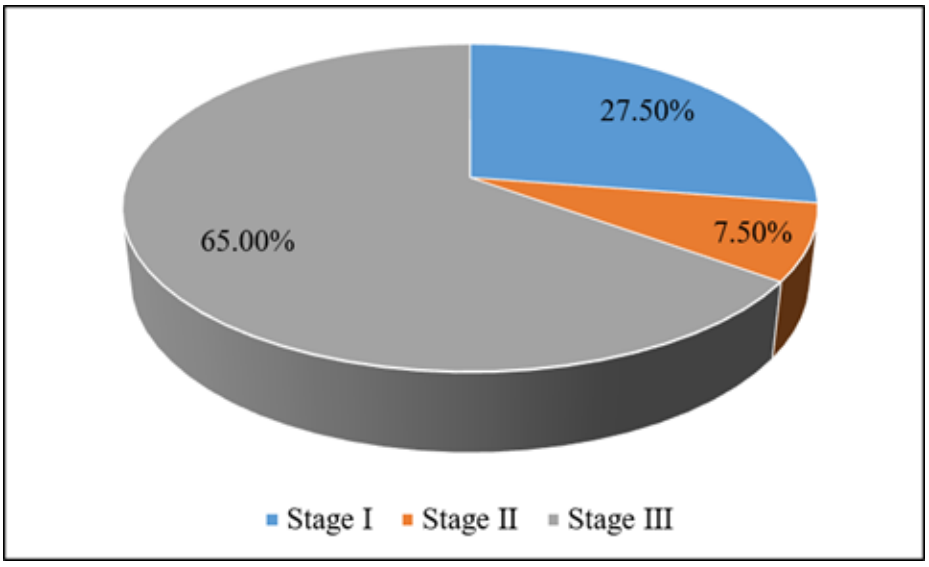
Figure 1: Distribution according to type of AKI



The majority of participants, 78 (65.0%), were classified as Stage III AKI. Stage I and Stage II AKI were observed in 33 (27.5%) and 9 (7.5%) participants, respectively, (Figure 2).

On ABG results, 15 participants (12.5%) exhibited metabolic acidosis. 18 participants (15.0%) had abnormal 2D echo findings

Figure 2: Distribution based on staging of AKI



The mean WBC count among the study participants was 14.89±8.16, while the mean hemoglobin level was 9.97±2.04 g/dL. The mean platelet count was 146.18±69.93, and the mean eGFR was 26.75±13.35 ml/min. Liver function parameters showed mean total bilirubin of 1.88±2.37, ALP of 87.60±30.69, SGOT of 81.78±94.92, and SGPT of 64.24±56.98. The mean serum sodium, potassium, and calcium levels were 137.51±7.47, 4.17±0.60, and 8.59±0.55, respectively.

There was a significant reduction in serum creatinine and blood urea levels, along with a significant increase in urine output, was observed over time ($p<0.001$), (Table 3).

Table 3: Changes in serum creatinine, blood urea, and urine output at different time intervals

Intervals		Minimum	Maximum	Mean	SD	P value
Sr. creatinine	On admission	0.80	12.60	3.10	2.57	<0.001
	At 12 hrs	1.50	12.90	3.84	2.76	
	At 24 hrs	0.90	13.60	3.96	2.75	
	At 48 hrs	0.30	12.80	3.57	2.66	
	On discharge	0.30	7.30	1.41	1.65	
Blood urea	On admission	12.00	301.00	82.60	63.73	<0.001
	At 12 hrs	12.00	254.00	97.23	57.13	
	At 24 hrs	30.00	254.00	94.27	49.08	
	At 48 hrs	20.00	223.00	82.03	46.33	
	On discharge	17.00	147.00	50.55	27.49	
Urine output	On admission	20.00	909.00	250.46	220.25	<0.001
	At 12 hrs	50.00	1212.00	442.04	299.03	
	At 24 hrs	75.00	4646.00	777.58	798.63	
	At 48 hrs	100.00	2424.00	870.48	555.61	
	On discharge	100.00	2828.00	1624.17	572.17	

The most common treatment provided was a combination of intravenous fluids and antibiotics, given to 33 participants (27.5%). Hemodialysis (HD) with or without antibiotics was administered to 21 (17.5%) and 18 (15.0%) participants, respectively. Various other treatments were administered to smaller groups of participants, (Table 4).

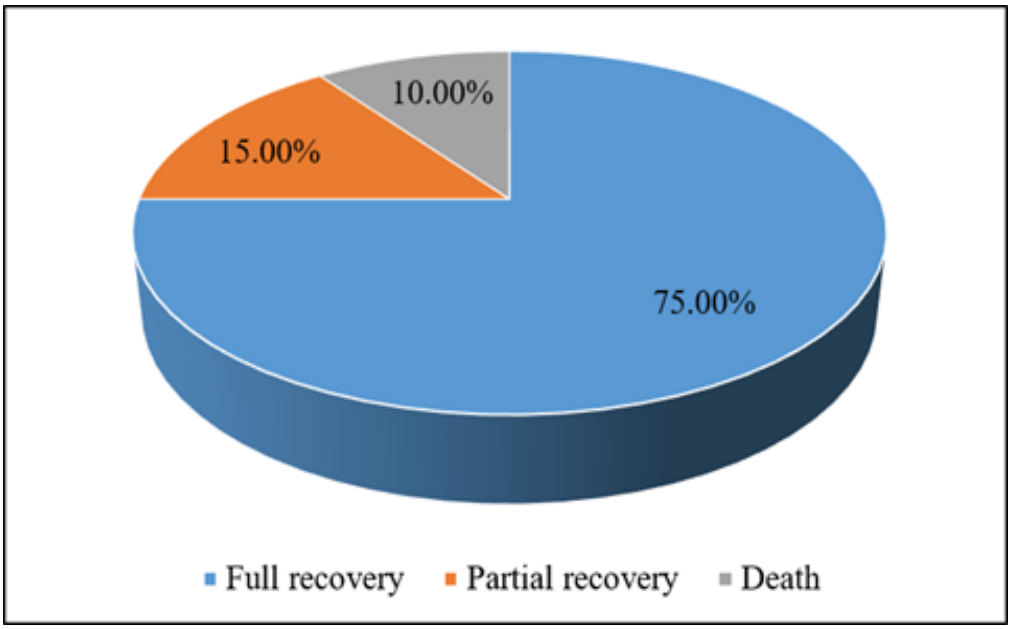
Table 4: Distribution of treatment among study participants

Treatment	Frequency	Percent
Blood transfusion with ionotropic support	03	2.50%
Diuretics and supportive treatment	03	2.50%
Forced alkaline diuresis	03	2.50%
HD	21	17.50%
HD with antibiotics	18	15.00%
HD with antibiotics and fluids	06	5.00%
Ionotropes with lasix	03	2.50%

Ionotropic support	03	2.50%
Ionotropes and fluid	03	2.50%
IV fluid and Foley's insertion	03	2.50%
IV fluids	15	12.50%
IV fluids and antibiotic	33	27.50%
PCN drain insertion	03	2.50%
PLEX and IVIG	03	2.50%
Total	120	100.0%

total of 45 participants (37.5%) underwent hemodialysis. The oliguria was the most common indication for hemodialysis, (18; 40.0%). Other indications included metabolic acidosis with uremic encephalopathy (7;15.6%), metabolic acidosis alone (6;13.3%) and metabolic acidosis with oliguria (6;13.3%). Oliguria with uremic encephalopathy and oliguria with fluid overload were observed in 8.9% of patients each. The mean hospital stay was 9.13±4.45 days. Out of 120 patients, majority, 90 participants (75%), achieved full recovery. 18 participants (15%) had partial recovery, while 12 participants (10%) died, (Figure 3).

Figure 3: Distribution according to outcomes



A statistically significant association was observed between etiology, probable cause, hemodialysis, and outcome ($p<0.001$). Full recovery was achieved in 90.3% of patients with prerenal AKI and all patients with postrenal AKI, whereas renal AKI showed lower recovery (67.5%) with higher partial recovery (21.7%) and mortality (10.8%). Among patients who underwent hemodialysis, 46.7% achieved full recovery, 33.3% had partial recovery, and 20.0% died, while 92.0% of patients who did not undergo hemodialysis achieved full recovery, (Table 5).

Table 5: Association of etiology, probable cause, and hemodialysis with outcome among study participants

Parameters		Full Recovery n (%)	Partial Recovery n (%)	Death n (%)	Total
Etiology	Acute gastroenteritis	9 (100.0%)	0 (0.0%)	0 (0.0%)	9
	Acute pancreatitis	6 (100.0%)	0 (0.0%)	0 (0.0%)	6
	Bacterial meningitis	6 (100.0%)	0 (0.0%)	0 (0.0%)	6
	Cardiogenic shock	15 (83.3%)	0 (0.0%)	3 (16.7%)	18
	Chronic liver disease	0 (0.0%)	0 (0.0%)	3 (100.0%)	3
	Dehydration	3 (100.0%)	0 (0.0%)	0 (0.0%)	3
	Drug induced	9 (60.0%)	3 (20.0%)	3 (20.0%)	15
	LRTI	9 (100.0%)	0 (0.0%)	0 (0.0%)	9
	LRTI with UTI	0 (0.0%)	3 (100.0%)	0 (0.0%)	3
	Obstructive uropathy	6 (100.0%)	0 (0.0%)	0 (0.0%)	6
	Puerperal sepsis	3 (33.3%)	6 (66.7%)	0 (0.0%)	9
	SLE	3 (100.0%)	0 (0.0%)	0 (0.0%)	3
	Snake bite	6 (66.7%)	3 (33.3%)	0 (0.0%)	9
	Urinary tract infection	6 (66.7%)	0 (0.0%)	3 (33.3%)	9
	Viral haemorrhagic fever	9 (75.0%)	3 (25.0%)	0 (0.0%)	12
Probable Cause	Prerenal	28 (90.3%)	0 (0.0%)	3 (9.7%)	31
	Renal	56 (67.5%)	18 (21.7%)	9 (10.8%)	83
	Postrenal	6 (100.0%)	0 (0.0%)	0 (0.0%)	6
Hemodialysis	Yes	21 (46.7%)	15 (33.3%)	9 (20.0%)	45
	No	69 (92.0%)	3 (4.0%)	3 (4.0%)	75

Discussion

In the present study, the majority of participants belonged to the 30–60 years age group (60.0%), with a mean age of 48.75±14.41 years, indicating that AKI was more common among middle-aged adults. The gender distribution was nearly equal, with females accounting for 50.8% and males for 49.2% of the study population. A higher proportion of participants were from rural areas (68.3%) compared to urban areas (31.7%), suggesting a greater burden of AKI among the rural population. Similar demographic findings were also reported by Ahmed Ibrahim et al[9] and Bhattacharya et al.[10]

The fever was the most common presenting symptom, observed in 51.7% of patients, followed by breathlessness (31.7%) and decreased urine output (30.8%). Altered sensorium was noted in 15.0% of cases, while burning micturition was less common (7.5%). Comparable observations were also reported by Ibrahim et al[9] and Bhattacharya et

al.[10] Regarding comorbidities, the majority of participants (59.2%) had no associated comorbid conditions. Among those with comorbidities, combined hypertension and diabetes mellitus was the most common, followed by isolated diabetes mellitus and hypertension. Similar patterns of associated comorbidities were observed in studies conducted by Ibrahim et al[9], Bhattacharya et al[10] and Sah VK et al.[11] The cardiogenic shock was the most common etiology of AKI, observed in 15.0% of patients, followed by drug-induced causes (12.5%) and viral hemorrhagic fever (10.0%). Other etiologies included acute gastroenteritis, lower respiratory tract infection, and various infectious and systemic conditions. Similar etiological patterns were reported by Ibrahim et al[9] and Bhattacharya et al.[10]

In the present study, Stage III AKI was the most common presentation, observed in 65.0% of participants, followed by Stage I (27.5%) and Stage II (7.5%) AKI, which is correlated with the study done by Bhattacharya et al.[10] Regarding the type of AKI, renal AKI was the predominant form, accounting for 69.2% of cases, while prerenal and postrenal AKI were observed in 25.8% and 5.0% of participants, respectively. Comparable observations were reported by Deshpande NS et al.[12]

The mean serum creatinine level increased from 3.10±2.57 mg/dL on admission to 3.96±2.75 mg/dL at 24 hours and gradually decreased to 1.41±1.65 mg/dL at discharge, showing a statistically significant improvement ($p<0.001$). Similar findings were reported by Bhattacharya et al.[10] The mean blood urea level also showed significant variation, rising from 82.60±63.73 mg/dL on admission to 97.23±57.13 mg/dL at 12 hours, followed by a decline to 50.55±27.49 mg/dL at discharge ($p<0.001$). Comparable observations were noted by Ibrahim et al[9] and Bhattacharya et al.[10] Hematological and biochemical investigations in the present study revealed a mean WBC count of 14.89±8.16 $\times 10^3/\mu L$, hemoglobin level of 9.97±2.04 g/dL, platelet count of 146.18±69.93 $\times 10^3/\mu L$, and mean eGFR of 26.75±13.35 mL/min. Similar laboratory findings were reported by Ibrahim et al.[9]

Regarding treatment modalities, the most commonly administered treatment was a combination of intravenous fluids and antibiotics (27.5%). Hemodialysis with or without antibiotics was provided to 17.5% and 15.0% of patients, respectively. Overall, 37.5% of participants underwent hemodialysis. Comparable findings were reported by Pillai VSN et al (hemodialysis in 25.7% of patients)[13] and Bhattacharya et al (24% of patients required hemodialysis)[10], although some Indian studies have documented higher hemodialysis rates exceeding 75%.[14,15]

In the present study, 75.0% of participants achieved full recovery, 15.0% had partial recovery, and 10.0% died, which is comparable with the findings of Pillai VSN et al.[13] Better outcomes were observed in patients with prerenal and postrenal AKI, with full recovery rates of 90.3% and 100.0%, respectively, whereas renal AKI showed comparatively poorer outcomes. A statistically significant association was observed between AKI

etiology and outcome (p<0.001). The need for hemodialysis was also significantly associated with outcome (p<0.001). Among patients who underwent hemodialysis, 46.7% achieved full recovery, 33.3% had partial recovery, and 20.0% died, while 92.0% of those not requiring hemodialysis achieved full recovery, indicating that the requirement of dialysis was associated with more severe disease and poorer prognosis. Half of the participants (50.0%) had a hospital stay of 7 days or less, while 30.8% stayed for 8–14 days and 19.2% stayed for 15–21 days. The mean duration of hospital stay was 9.13±4.45 days. These findings are comparable with the study done by Ibrahim et al[9] and Bhattacharya et al.[10]

Conclusion

In the present study, AKI was commonly observed among middle-aged patients, particularly from rural areas, with renal AKI and Stage III disease being the predominant presentations. Cardiogenic shock, drug-induced causes, and viral hemorrhagic fever were the major etiological factors. Significant improvement in renal parameters and urine output was achieved with appropriate management. Intravenous fluids, antibiotics, and hemodialysis were the main treatment modalities, with oliguria being the most common indication for dialysis. Most patients recovered completely; however, outcomes were poorer among patients with renal AKI and those requiring hemodialysis, indicating more severe disease. Early diagnosis, timely intervention, and effective management, especially in prerenal and postrenal AKI, are essential for improving prognosis and reducing mortality.

References

1. Ali T, Khan I, Simpson W, Prescott G, Townend J, Smith W, et al. Incidence and outcomes in acute kidney injury: a comprehensive population-based study. J Am SocNephrol: JASN. 2007;18(4):1292-8.
2. Ponce D, Balbi A. Acute kidney injury: risk factors and management challenges in developing countries. Int J Nephrol Renovascular Dis. 2016; 9:193-200.
3. Kidney Disease Improving Global Outcomes (KDIGO) Clinical Practice Guideline for Acute Kidney Injury. Kidney Int Suppl. 2012; 2:1–138.
4. Goyal A, Daneshpajouhnejad P, Hashmi MF, et al. Acute Kidney Injury. [Updated 2023 Nov 25]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2026 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK441896/
5. Case J, Khan S, Khalid R, Khan A. Epidemiology of acute kidney injury in the intensive care unit. Crit Care Res Prac. 2013;479730.
6. Gurjar M, Baronia AK, Azim A, Prasad N, Jain S, Singh RK, et al. Septic acute kidney injury in critically ill Indian patients. Ind J Crit Care Med. 2013;17(1):49-52.
7. Singh TB, Rathore SS, Choudhury TA, Shukla VK, Singh DK, Prakash J. Hospital-acquired acute kidney injury in medical, surgical, and intensive care unit: A comparative study. Ind J Nephrol. 2013;23(1):24-9.

8. Priyamvada PS, Jayasurya R, Shankar V, Parameswaran S. Epidemiology and Outcomes of Acute Kidney Injury in Critically Ill: Experience from a Tertiary Care Center. Ind J Nephrol. 2018;28(6):413-20.
9. Ibrahim A, Ahmed MM, Kedir S, Bekele D. Clinical profile and outcome of patients with acute kidney injury requiring dialysis-an experience from a haemodialysis unit in a developing country. BMC Nephrol. 2016; 17(1):91.
10. Bhattacharya PK, Roy A, Jamil M, Barman B, Murti SV, Marak PR. Clinical profile and determinants of short-term outcome of acute kidney injury: A hospital-based prospective study from Northeastern India. J Lab Physicians 2019; 11:5-10.
11. Sah VK, Prakash S. Clinical profile of patients with acute kidney injury admitted in intensive care unit. Int J Adv Med 2022; 9:532-6.
12. Deshpande NS, Harkut J. Clinical profile and etiogical spectrum of patients with acute kidney injury at atertiary care hospital. MedPulse International Journal of Medicine. September 2020; 15(3): 69-73.
13. Pillai VSN, Varghese CJ, Pais CC,Rai VG, Chakrapani M. Clinical profile and outcomes ofacute kidney injury patients in an intensive care unit inIndia. Int J Clin Trials 2020;7(4):245-9.
14. Mahajan S, Tiwari S, Bharani R, Bhowmik D, Ravi S, Agarwal SK, et al. Spectrum of acute renal failure and factors predicting its outcome in an intensive care unit in India. Renal Failure. 2006;28(2):119-24.
15. Sural S, Sharma RK, Singhal MK, Kher V, Gupta A, Arora P, et al. Acute renal failure in an intensive care unit in India--prognostic factors and outcome. J Nephrol. 1999; 12(6):390-4.