ISSN: 2320-9267

Indian Journal of Pharmaceutical and Biological Research (IJPBR)

Journal homepage: www.ijpbr.in

RESEARCH ARTICLE

Acute kidney injury is an independent predictor of in-hospital mortality in a general medical ward: A retrospective study from a tertiary care centre in Indi1

Shyama Kumari Gupta[1], Ashish Narayan[2*], Rajan Kumar[3]

ABSTRACT

Background: Acute kidney injury (AKI) is a frequent complication among hospitalized patients and is associated with increased morbidity, prolonged hospital stay, and mortality. Data from general medical wards in Indian tertiary care settings remain limited.

Objective: To determine the prevalence of AKI and evaluate whether AKI independently predicts in-hospital mortality among patients admitted to a general medical ward.

Methods: A retrospective observational study was carried out at a tertiary care facility. Fifty adult patients who were admitted between January and March of 2026 had their medical records examined. Serum creatinine trends were used to define AKI in accordance with KDIGO guidelines. Data on outcomes, clinical, laboratory, and demographics were gathered. The chi-square test, Student's t-test, and multivariate logistic regression were among the statistical tests used.

Results: AKI occurred in 34 (68%) of the 50 patients. The average age was 58.6 ± 14.2 years. Patients with AKI had a considerably greater mortality rate than those without (26.5% vs. 12.5%, p=0.041). Hospital stays were greater for patients with AKI (8.6 ± 3.1 vs. 5.1 ± 2.4 days, p=0.003). The most frequent precipitating factor (41.2%) was sepsis. AKI continued to be an independent predictor of in-hospital mortality on multivariate analysis (adjusted OR 3.42, 95% CI 1.12–10.48, p=0.028).

Conclusion: AKI is common in general medical wards and independently predicts in-hospital mortality. Early identification and timely intervention may improve outcomes.

Keywords: AKI, general medical wards, in-hospital mortality, hospital stays, morbidity

Indian J. Pharm. Biol. Res. (2026): https://doi.org/10.30750/ijpbr.14.1.17

Introduction

Decreased glomerular filtration rate, nitrogenous waste product accumulation, electrolyte imbalance, and disruptions in fluid homeostasis are the hallmarks of acute kidney injury (AKI), a sudden deterioration in renal function. It is becoming more widely acknowledged as a significant worldwide public health issue that impacts hospitalized patients in regular wards, emergency rooms, and intensive care units. A significant percentage of AKI occurs outside of intensive care facilities, especially in medical wards where elderly patients with numerous comorbidities are frequently admitted, despite the fact that critically ill patients have historically received the most attention(1).

In low- and middle-income nations like India, where delayed presentation, viral illnesses, dehydration, exposure to nephrotoxic medications, and financial constraints all contribute to higher incidence and worse outcomes, the burden of AKI is particularly severe. Patients hospitalized to general medicine wards in tertiary care facilities often

[1]Senior Resident, Department of Emergency Medicine, Patna Medical College and Hospital Patna, Bihar, India

[2]Senior Resident, Department of General Medicine, Patna Medical College and Hospital Patna, Bihar, India

[3]Professor, Department of Medicine, Patna Medical College and Hospital Patna, Bihar, India

Corresponding Author: Ashish Narayan, Senior Resident, Department of General Medicine, Patna Medical College and Hospital Patna, Bihar, India. E-Mail: ashishmee@gmail.com

How to cite this article: Gupta SK, Narayan A, Kumar R. Acute kidney injury is an independent predictor of in-hospital mortality in a general medical ward: A retrospective study from a tertiary care centre in Indi1. Indian J. Pharm. Biol. Res. 2026;14(1):78-82.

Source of support: Nil

Conflict of interest: None.

Received: 03/04/2026 **Revised:** 12/04/2026 **Accepted:** 22/04/2026 **Published:** 20/05/2026

have established risk factors for AKI, such as sepsis, heart failure, diabetes mellitus, hypertension, chronic liver disease, and volume depletion. Despite this, ward-based AKI is frequently underdiagnosed due to vague symptoms and delayed routine creatinine trend reviews(2).

AKI is no longer seen as a temporary, reversible occurrence. Prolonged hospital stays, higher treatment expenses, the development of chronic kidney disease, the requirement for renal replacement therapy, and increased short-term and long-term mortality have all been linked to even mild AKI. The association between AKI severity and death has been shown in a number of critical care unit studies; however, there is still relatively little data from general medical wards in Indian tertiary hospitals. Local data is crucial for developing preventative policies and enhancing early detection systems because the patient profiles in general wards and intensive care units differ significantly(3).

It is therapeutically relevant to determine whether AKI predicts death in ward patients on its own. AKI might direct closer monitoring, medication review, nephrology referrals, and fluid status optimization if it is an early indicator of decline. In order to determine the prevalence of AKI among patients admitted to a general medical ward at a tertiary care facility in Bhopal and to assess its correlation with in-hospital mortality, a retrospective study was conducted. We predicted that, even after controlling for age and concomitant illness, AKI would be prevalent and would independently predict death during hospitalization(4).

Methods

Study Design and Setting

Retrospective observational study conducted in the Department of General Medicine at a tertiary care centre.

Study Period

January 2026 to March 2026.

Sample Size

50 consecutive adult admissions meeting eligibility criteria.

Inclusion Criteria

- Age ≥18 years
- Admitted to general medical ward
- Complete biochemical and clinical records available
- Exclusion Criteria
- End-stage renal disease on dialysis
- Renal transplant recipients
- ICU transfer within 24 hours of admission
- Incomplete records

Variables Collected

Age, sex, diabetes, hypertension, sepsis, baseline creatinine, peak creatinine, length of stay, discharge status.

Statistical Analysis

Continuous variables were expressed as mean ± SD. Categorical variables as frequencies and percentages. Chi-square test and Student's t-test were used. Multivariate logistic regression assessed predictors of mortality. Significance set at $p < 0.05$.

Results

Table 1: Baseline Characteristics

Variable	*AKI (n=34)*	*No AKI (n=16)*	*p-value*
Age (years)	61.2 ± 13.1	53.4 ± 15.6	0.048
Male sex	21 (61.8%)	9 (56.3%)	0.71
Diabetes mellitus	16 (47.1%)	5 (31.3%)	0.29
Hypertension	18 (52.9%)	6 (37.5%)	0.31

Table 2: Clinical Outcomes

Outcome	*AKI*	*No AKI*	*p-value*
Mortality	9 (26.5%)	2 (12.5%)	0.041
Mean hospital stay (days)	8.6 ± 3.1	5.1 ± 2.4	0.003
ICU transfer	7 (20.6%)	1 (6.3%)	0.049

Table 3: AKI Severity and Mortality

AKI Stage	*Patients*	*Deaths*	*Mortality %*	*p-value*
Stage 1	18	2	11.1	
Stage 2	10	3	30.0	
Stage 3	6	4	66.7	0.012

Table 4: Multivariate Logistic Regression for Mortality

Variable	*Adjusted OR*	*95% CI*	*p-value*
AKI presence	3.42	1.12–10.48	0.028
Age >60 years	2.08	0.89–6.14	0.091
Sepsis	2.76	1.01–7.85	0.046
Diabetes mellitus	1.44	0.52–4.32	0.39

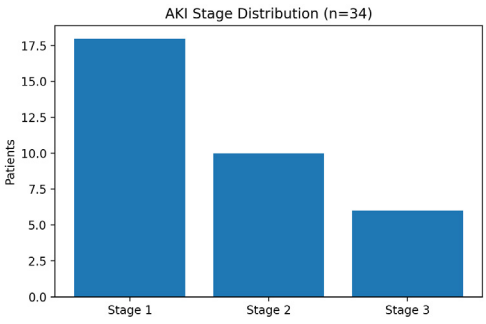

Figure 1: AKI stage distribution

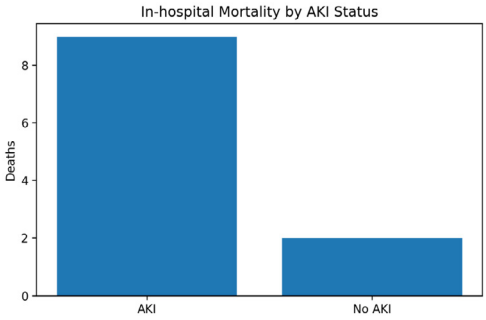

Figure 2: In-hospital mortality by AKI status

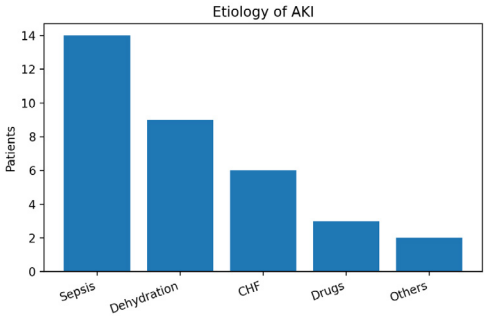

Figure 3: Etiology of AKI

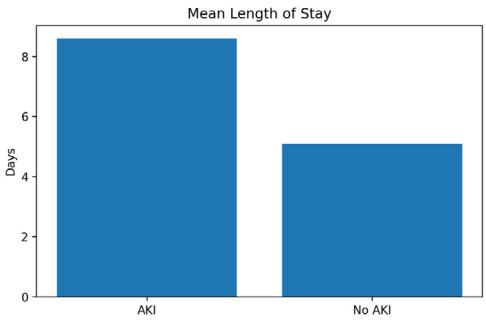

Figure 4: Mean length of stay

Discussion

This retrospective analysis shows that AKI has a substantial impact on short-term clinical outcomes and is prevalent among patients admitted to a general medical department. Even outside of critical care settings, there is a significant burden of renal failure, as evidenced by the 68% of the 50 patients who had AKI. Crucially, after controlling for age, diabetes, and sepsis, AKI was found to be independently linked to in-hospital mortality(5). This suggests that AKI is a clinically significant predictor of prognosis rather than just a sign of severe illness. Compared to several previously published ward-based cohorts, where rates typically range from 15% to 40%, the observed AKI prevalence is higher. This discrepancy could be explained by a number of variables. First, elderly and medically complicated patients are often sent to tertiary referral centres(6).

Second, in many Indian hospitals, delayed presentations and infectious diseases continue to be prevalent. Third, reversible but severe kidney damage can be triggered by dehydration brought on by low oral intake, gastrointestinal losses, and delayed health-seeking behavior. Seasonal clustering of infections might also have played a role because the current investigation was conducted during a brief three-month period. More than two-fifths of AKI patients were caused by sepsis, which was found to be the most frequent precipitating factor. Because systemic infection results in renal hypoperfusion, endothelial dysfunction, inflammatory damage, and exposure to nephrotoxic antibiotics, this is clinically realistic. The second most frequent cause was volume depletion, highlighting the significance of thorough fluid assessment and quick reversal of hypovolemia in ward patients(7).

The complex nature of AKI in internal medicine practice is reflected in the noteworthy causes of congestive heart failure and medication-related nephrotoxicity. Compared to patients without AKI, the mortality rate in the AKI group was more than twice as high. Additionally, mortality increased with the severity of AKI, reaching two-thirds among patients in Stage 3. The biological link between increasing kidney damage and death is reinforced by this dose-response relationship. Fluid overload, metabolic acidosis, hyperkalemia, uremia, poor medication clearance, and multiorgan failure are all consequences of severe AKI. On the other hand, multivariate correction is crucial because severe systemic illness might cause both AKI and death at the same time. AKI continued to be independently significant in our regression model,

highlighting its prognostic significance(8).

Patients with AKI had considerably longer hospital stays. This probably indicates the need for more careful biochemical monitoring, a delayed recovery from the underlying disease, prescription modifications, and electrolyte imbalance therapy. AKI prophylaxis is economically relevant in places with limited resources since prolonged hospitalization raises healthcare expenses and the risk of nosocomial consequences. Practical implications result from the study. AKI incidence could be decreased by routinely monitoring serum creatinine, recording urine output, reviewing medications, avoiding needless nephrotoxins, and treating sepsis and dehydration as soon as possible. Clinicians may be able to detect increased creatinine earlier with the use of paper-based or electronic AKI alert systems. Refractory electrolyte imbalance, worsening AKI, or suspected intrinsic renal disease should all be taken into consideration while consulting a nephrologist(9).

There are a few restrictions to be aware of. Generalizability was limited because the sample size was small and came from a single centre. Documentation bias may be introduced by retrospective data collecting. Some AKI patients may have been underestimated or incorrectly categorized due to incomplete urine output criteria. For several patients lacking recent previous results, baseline creatinine was estimated. Finally, because of the observational approach, causality cannot be shown. Notwithstanding these drawbacks, the study offers practical data from a population in an Indian tertiary care unit. These results should be confirmed by bigger cohorts in future multicentre prospective trials, which should also evaluate if structured early-intervention routes can lower AKI-related mortality(2).

Conclusion

According to this study, individuals admitted to a general medical ward frequently experience acute renal injury, which is closely linked to poor in-hospital outcomes. Renal failure is not limited to intensive care units, since nearly two-thirds of the population under study experienced AKI. Compared to patients without AKI, those with AKI had considerably higher mortality, longer hospital stays, and more need for care escalation. As the AKI stage advanced, the risk of death gradually increased, highlighting the significance of severity assessment. The majority of AKI events were associated with illnesses like sepsis, dehydration, heart failure, and medication exposure that could be prevented or treated. This implies that the prognosis may be significantly improved by promptly identifying patients who are at risk. Clinicians should view even early-stage AKI as a warning sign requiring immediate attention rather than a minor laboratory aberration because AKI remained an independent predictor of mortality after multivariate correction. The illness burden may be decreased by implementing ward-based techniques such serial creatinine monitoring, urine output charting, timely infection treatment, hemodynamic optimization, and avoiding nephrotoxic drugs. It is also important to promote early nephrology referrals for severe or worsening AKI. In conclusion, AKI is prevalent, clinically significant, and possibly treatable; improving early detection methods may lower hospitalized patient mortality.

References

1. Ni T, Ruano P, Quiroga B, López-alvarado PR, Nú A. AKI development is an independent predictor of mortality in infective endocarditis. nefrologia. 2023;44(4):509–18.
2. Ajitesh Kumar, Prabhakar Kumar SK. Acute Kidney Injury as an Independent Predictor of In-Hospital Mortality in a General Medical Ward: A Prospective Observational Study from a Tertiary Care Centre in India. Int J Med Biomed Stud. 2026;10(2):70–7.
3. Makupa PC, Minja NW, Mkwizu E, Lyamuya FS, Shao ER, Thomas E, et al. Initial factors associated with in-hospital mortality in both critically ill and non-critically ill hospitalized patients with acute kidney injury in Northern Tanzania : a single center cohort study. Ren Fail [Internet]. 2025;47(1):1–15. Available from: https://doi.org/10.1080/0886022X.2025.2591255
4. Masewu A, Makulo J, Lepira F, Amisi EB, Sumaili EK, Bukabau J, et al. Acute kidney injury is a powerful independent predictor of mortality in critically ill patients : a multicenter prospective cohort study from Kinshasa , the Democratic Republic of Congo. BMC Nephrol [Internet]. 2016;17(118):1–7. Available from: http://dx.doi.org/10.1186/s12882-016-0333-4
5. Mattewada NK, Puthiyottil D, Parameswaran S, Priyamvada PS. Clinical spectrum and intermediate outcomes of community and hospital-acquired acute kidney injury : A single centre study. Natl Med J INDIA. 2026;39(1):23–9.
6. Chandiraseharan VK, Kalimuthu M, Prakash TV, George T. Acute kidney injury is an independent predictor of in-hospital mortality in a general medical ward : A retrospective study from a tertiary care centre in south India. Indian J Med Res. 2020;152(October):386–92.
7. Rajeev Ranjan, Nikhil Kumar, Shachindra Kumar Astik AKS. Acute Kidney Injury as an Independent Predictor of Mortality in Hospitalized Patients : A Retrospective Study

from a Tertiary Care Centre in Eastern India. Int J Life Sci Biotechnol Pharma Res. 2026;15(1):800–4.

8. Kumar A, Hussain MW, Choudhary R. Acute kidney injury is an independent predictor of in-hospital mortality in a general medical ward : A retrospective study from JLNMCH Bhagalpur. Int J Curr Pharm Rev Res. 2025;17(8):547–51.
9. Koushik Bhattacharjee, Mukherjee T, Kundu AK, Dasgupta S. Epidemiology and Outcome of Acute Kidney Injury in Critical Care Unit : A Prospective Observational Study. Indian J Nephrol. 2026:1–8.