



SEVERITY AND SPECTRUM OF ACUTE KIDNEY INJURY IN DENGUE FEVER WITH THROMBOCYTOPENIA

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ABSTRACT

Background: Dengue fever, a prevalent tropical disease caused by the dengue flavivirus, is frequently complicated by thrombocytopenia and acute kidney injury (AKI), increasing morbidity in endemic regions like India. AKI in dengue is often driven by dehydration and systemic inflammation, necessitating early diagnosis and management. **Aims And Objectives:** This study aimed to evaluate the severity and spectrum of AKI in patients with dengue fever and thrombocytopenia using KDIGO guidelines, and to assess clinical outcomes based on estimated glomerular filtration rate (eGFR) at discharge. **Methods:** An observational cross-sectional study was conducted at SSMC & Hospital, Tumakuru, Karnataka, India, over 18 months, involving 49 patients with laboratory-confirmed dengue fever among 100 cases of acute febrile illness with thrombocytopenia. AKI was staged per KDIGO criteria, with eGFR calculated using the MDRD formula at discharge. Data included renal function tests, serological confirmation, and management details. **Results:** Of the 49 dengue cases, 45 (91.8%) had Stage I AKI, 3 (6.1%) had Stage II, and 1 (2.04%) had Stage III, primarily due to dehydration. Conservative management with fluid correction was effective in 48 cases (97.96%), with one Stage III case requiring renal replacement therapy (RRT) recovering to Stage II. At discharge, 35 patients (71.43%) had eGFR >90 mL/min/1.73 m², 10 (20.41%) had >60 mL/min/1.73 m², and 4 (8.16%) had >15 mL/min/1.73 m². **Conclusion:** Dengue fever with thrombocytopenia predominantly presents with mild (Stage I) AKI, effectively managed with fluid therapy. Severe AKI is rare but reversible with timely RRT, and most patients achieve favourable renal outcomes, highlighting the importance of early intervention.

KEYWORDS : Dengue fever, Acute kidney injury, Thrombocytopenia, KDIGO guidelines, eGFR, Fluid therapy, Renal replacement therapy.

INTRODUCTION

Dengue fever, caused by the dengue flavivirus and transmitted by *Aedes aegypti* mosquitoes, is a major public health concern in tropical regions, including India.⁶ It is associated with complications such as thrombocytopenia and acute kidney injury (AKI), which increase morbidity and mortality.^{3,7} AKI in dengue is often linked to dehydration, hemodynamic instability, and systemic inflammation.³ This study aimed to assess the severity and spectrum of AKI in patients with dengue fever and thrombocytopenia and to evaluate outcomes based on KDIGO staging⁴ and eGFR at discharge.

MATERIALS AND METHODS

Study Design And Population

This observational cross-sectional study was conducted in the Department of General Medicine at SSMC & Hospital, Tumakuru, Karnataka, India, over 18 months. A total of 100 patients with acute febrile illness and thrombocytopenia were enrolled, of which 49 had laboratory-confirmed dengue fever.¹ Patients above 18 years with platelet counts <150,000/ μ L and AKI, as defined by KDIGO guidelines,⁴ were included. Exclusion criteria included patients <18 years, pregnant women, those with snake bites, bacterial sepsis, immunocompromised states, or other causes of thrombocytopenia.

Data Collection

AKI was staged using KDIGO criteria: Stage I (serum creatinine increase ≥ 0.3 mg/dL within 48 hours or 1.5–1.9 times baseline), Stage II (serum creatinine 2–2.9 times baseline), and Stage III (serum creatinine >3 times baseline or requiring RRT).⁴ Baseline creatinine was assumed to be 0.8 mg/dL if unknown. Investigations included complete blood count, renal function tests, serological tests for dengue (IgM/IgG), and urine analysis. eGFR was calculated at discharge using the MDRD formula to assess outcomes: complete recovery (>60 mL/min/1.73 m²), partial recovery (15–60 mL/min/1.73 m²), no recovery (<15 mL/min/1.73 m²), or death.²

Statistical Analysis

Data were tabulated and analyzed to determine the distribution of AKI stages, management strategies, and eGFR outcomes. The association between AKI severity and dengue fever was assessed, with a p-value of 0.05 considered significant.

RESULTS

Of the 49 dengue fever cases, 45 (91.8%) had Stage I AKI, 3 (6.1%) had Stage II, and 1 (2.04%) had Stage III (Table 1). The primary cause of AKI was dehydration, with most Stage I cases responding to conservative management (fluid correction).⁸ The single Stage III case required three sessions of RRT and recovered to Stage II at discharge. No deaths were reported among dengue cases.

Table 1: Distribution Of AKI Stages In Dengue Fever Cases

AKI STAGE	NUMBER OF CASES	PERCENTAGE (%)
Stage I	45	91.8
Stage II	3	6.1
Stage III	1	2.04
TOTAL	49	100

Management And Outcomes

Conservative management with fluid correction was effective in 48 cases (97.96%), with complete recovery in 45 cases (Table 2).⁸ The patient with Stage III AKI required RRT but achieved partial recovery (eGFR 15–60 mL/min/1.73 m²). eGFR at discharge showed 35 patients (71.43%) with >90 mL/min/1.73 m², 10 (20.41%) with >60 mL/min/1.73 m², and 4 (8.16%) with >15 mL/min/1.73 m² (Table 3).²

Table 2: Management Strategies For Dengue Fever With AKI

MANAGEMENT TYPE	NUMBER OF CASES	PERCENTAGE (%)
Conservative (Fluids)	48	97.96
Renal Replacement Therapy	1	2.04
TOTAL	49	100

Table 3: eGFR Outcomes At Discharge In Dengue Fever Cases

eGFR (mL/min/1.73 m ²)	NUMBER OF CASES	PERCENTAGE (%)
>90	35	71.43
>60	10	20.41
>15	4	8.16
TOTAL	49	100

Comorbidities

Among the 49 dengue cases, 12 (24.49%) had comorbidities, including diabetes (8 patients) and hypertension (6 patients). Patients with comorbidities predominantly had Stage I AKI (10/12) and achieved complete recovery at discharge, with no requirement for RRT.²

DISCUSSION

This study underscores the high prevalence of Stage I AKI (91.8%) in dengue fever with thrombocytopenia, primarily due to dehydration, consistent with prior studies.^{1,3} The low incidence of Stage III AKI (2.04%) and the effectiveness of conservative management highlight the importance of early fluid therapy.⁸ The single Stage III case, requiring RRT, recovered to Stage II, indicating the potential for reversibility with timely intervention.³ The eGFR outcomes suggest a low risk of progression to chronic kidney disease in most cases, with 71.43% achieving eGFR >90 mL/min/1.73 m².² Compared to other acute febrile illnesses like rickettsial fever, dengue had milder AKI, with a statistically significant p-value (0.05) when comparing AKI severity across diseases.^{1,5,10} The findings align with global trends in dengue-associated AKI, emphasizing the need for early diagnosis and management to reduce morbidity.^{6,7}

CONCLUSION

Dengue fever with thrombocytopenia predominantly presents with Stage I AKI, manageable with conservative fluid therapy. Severe AKI (Stage III) is rare but reversible with RRT. Early diagnosis and prompt management are critical to reducing morbidity. Future studies should explore long-term renal outcomes and the impact of comorbidities on AKI progression in dengue-endemic regions.^{5,9}

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