Original Article

An Analysis of the Clinical Characteristics and Results of Acute Kidney Injury in Acute Febrile Illness: A Prospective Study

Devendra Dadhich[1], Raghunath Prasad[2], Seetaram Mali[2], Ummed Singh[1]

[1]Associate Professor, Department of General Medicine, S K Government Medical College and Attached Hospital, Sikar, Rajasthan, India, [2]Assistant Professor, Department of General Medicine, S K Government Medical College and Attached Hospital, Sikar, Rajasthan, India.

Abstract

Background: AKI continues to be a substantial global health concern, with infectious aetiologies being more prevalent in tropical regions. Therefore, this investigation is being conducted to ascertain the prevalence and outcomes of acute kidney injury (AKI) in all patients admitted with a common acute flaccidity. **Material and Methods:** This is a hospital-based prospective study done on 100 hospitalized acute febrile illness patients with diagnosed AKI in the Department of General Medicine at S K Government Medical College and Attached Hospital, Sikar, Rajasthan, India, for one year. AKI was diagnosed based on the recent KDIGO AKI Guidelines. Descriptive statistics in SPSS 21.0v were used for statistical analysis. **Results:** Among the several AFI diagnoses found, dengue was the most common, followed by leptospirosis, malaria, scrub typhus, and unidentified causes. Dengue and Leptospirosis has been associated with a higher prevalence of acute kidney injury. The severity of AKI also varied according to the diagnosis. Dengue and Leptospirosis exhibited a broader spectrum of AKI phases, whereas Scrub Typhus and Malaria primarily exhibited less severe stages. **Conclusion:** Consequently, this investigation demonstrates the prevalence of acute kidney injury in a variety of acute febrile illnesses and its significance in the early detection and prevention of the condition, which may result in increased morbidity and mortality.

Keywords: AKI, AFI, Fever, Dengue, Malaria, Kidney injury.

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Introduction

The clinical illness known as acute kidney injury (AKI), formerly called acute renal failure, is defined by a sudden decline in glomerular filtration rate sufficient to reduce the removal of nitrogenous waste products (creatinine and urea) and other uremic toxins.[1]

A unique challenge arises in tropical and subtropical regions when acute kidney injury (AKI) occurs in patients with acute febrile illness (AFI) and thrombocytopenia (low platelet count). The term "Tropical Acute Febrile Illness" (TAFI) describes all acute febrile syndromes in tropical and subtropical developing countries with an oral temperature of 37.5 degrees Celsius or higher within the past 24 hours and expected to resolve within 2 weeks. It includes non-specific symptoms, such as fever, tachycardia, myalgia, conjunctival congestion, rashes, joint pains, and other symptoms that will not help us to localise to a particular system.[2-5]

The emergence and re-emergence of these infections in non-tropical countries, influenced by global warming and international travel, have reignited global interest in understanding the interplay between these diseases and AKI.[6] However, reliable data on the incidence and outcomes of AKI in this context remain limited due to inconsistent definitions of AKI and referral biases in tertiary care reports. Patients with AFI and thrombocytopenia have a complex and poorly known aetiology of AKI. Fever-induced dehydration frequently results in hypovolemia, which can lower renal perfusion and impair waste clearance.[7] Direct invasion of renal tissues by infectious agents may lead to cellular injury and diminished kidney function.

Furthermore, systemic inflammation and immune-mediated damage can exacerbate renal impairment.[8] These mechanisms act synergistically, making early detection and intervention crucial. However, conventional biomarkers such as serum creatinine may not accurately reflect early renal dysfunction, particularly in acutely ill patients, thereby delaying diagnosis and appropriate management. In India, comprehensive national data on AKI in the setting of AFI and thrombocytopenia are scarce. Most existing studies are limited to isolated centres of excellence and focus narrowly on specific diseases.[8] Recent data suggest that renal failure occurs in 41.3% of cases involving infections such as scrub typhus, dengue, leptospirosis, and malaria, with an associated mortality rate of 12.1%. These results demonstrate the critical need to enhance diagnosis and treatment for these individuals to reduce morbidity and in-hospital mortality. In order to ascertain the incidence and consequence of AKI amongst

Address for correspondence: Dr. Devendra Dadhich, Associate Professor, Department of General Medicine, S K Government Medical College and Attached Hospital, Sikar, Rajasthan, India.
E-mail: devdadhich3@gmail.com

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all patients hospitalised with frequently occurring AFI, this research is being conducted.

Materials and Methods

This is a hospital-based prospective study of 100 hospitalised patients with acute febrile illness and diagnosed AKI in the Department of General Medicine at S K Government Medical College and Attached Hospital, Sikar, Rajasthan, India, over one year.

Inclusion Criteria

Patients over the age of 18 who had an acute febrile illness and a platelet count below 150,000/mm3 and had acute kidney injury as a result of Dengue, Malaria, Leptospira infection, Rickettsial fever, Typhoid, or Chikungunya, as confirmed by laboratory tests.

Exclusion Criteria

1. Patients under the age of 18
2. Women who were pregnant
3. Incidence of snake bites
4. Sepsis caused by bacteria that exhibit clinical and radiological symptoms of pyelonephritis, pneumonia, meningitis, gastroenteritis, acute viral hepatitis, or intra-abdominal abscess.
5. Individuals with compromised immune systems
6. Individuals with chronic liver disease or inherited thrombocytopenia

Procedure: Informed consent was obtained from the patient to participate. Clinical and demographic information, along with the results of an exhaustive examination, were documented. Daily electrolyte assays were conducted and documented to assess renal function. Other laboratory parameters, including CBC, ESR, urine, stool, HIV, blood glucose, and liver function tests, were also conducted. Abdominal ultrasound, electrocardiograms, and blood tests were performed as needed. Any of the following criteria may be used to define AKI, as outlined in KDIGO (Kidney Disease: Improving Global Outcomes)9: 1. A 48-hour rise in serum creatinine (SCr) of at least 0.3 mg/dl (26.5% µmol/l); or 2. An rise in SCr within the last seven days to at least 1.5 times the baseline value, or 3. The urine volume must be less than 0.5mg/kg/hr for a period of six hours.

Statistical Analysis: Descriptive statistics in SPSS 21.0v were used for statistical analysis. The mean and standard deviation were used to present continuous data, while the frequency was reported as a count and percentage.

Results

According to our research, the most prevalent age group in this study was 61–70 years (25%), followed by 51–60 years (20%). The study participants' average age was 54.6 ± 10.8 years. There were more male patients (60%) than female patients (40%). The ratio of men to women was 1.5:1 [Table 1].

Table 1: Distribution by age

Age (Yrs)	Male N (%)	Female N (%)
19-30	5 (8.33%)	3 (7.5%)
31-40	8 (13.33%)	7 (17.5%)
41-50	10 (16.66%)	8 (20%)
51-60	12 (20%)	8 (20%)
61-70	15 (25%)	10 (25%)
>70	10 (16.66%)	4 (10%)
Total	60 (60%)	40 (40%)

Table 2: Identification and clinical manifestation of one hundred instances of severe fever

Diagnosis	Frequency	Clinical Presentation			
		Fever	Headache	Arthralgia	Bleeding tendencies
Dengue	30	30 (100%)	24(80%)	6 (20%)	6(20%)
Malaria	22	22 (100%)	8 (36.4%)	4 (18.1%)	2 (9.0%)
Scrub Typhus	14	14 (100%)	8 (5.7%)	4 (2.8%)	2 (1.4%)
Leptospirosis	8	4 (50%)	4 (50%)	2 (25%)	2 (25%)
Unspecified	26	22 (84.6%)	8 (30.8%)	6 (23.0%)	2 (7.7%)
Total	100	92 (92%)	52 (42%)	22 (22%)	14 (14%)

Table 3: Demonstrating the immediate kidney damage in 100 patients of high fever

Diagnosis	Frequency	Total No of AKI	Stage of AKI		
			Stage 1	Stage 2	Stage 3
Dengue	30	20(66.7%)	12	6	2
Malaria	22	8(36.4%)	6	2	0
Scrub Typhus	14	6(4.3%)	6	0	0
Leptospirosis	8	6(75%)	4	2	0
Unspecified	26	10(38.5%)	10	0	0
Total	100	50 (50.0%)	38	10	2

Fever was the most prevalent clinical manifestation among all diagnoses, with 92% of patients presenting with it. The most common diagnosis was dengue fever (30 cases), which was followed by malaria (22 cases), scrub typhus (14 cases), leptospirosis (8 cases), and unidentified causes (26 cases). Every dengue patient (100%) reported having a fever, and 80% of them also reported having a headache. Although less common, arthralgia (20%) and bleeding tendencies (20%) were

nevertheless present in a few instances. As with dengue, 100% of malaria patients reported fever. In contrast to dengue, headache (36.4%) and arthralgia (18.1%) were less frequent. In this group, bleeding tendencies were uncommon (9.0%). Again, fever was the most prevalent symptom (100%) for both leptospirosis and scrub typhus. In contrast to dengue and malaria, headache, arthralgia, and bleeding tendencies were less common. Fever persisted in a substantial number of patients in the unspecified category (84.6%) [Table 2]. Investigates the severity and prevalence of acute kidney injury (AKI). The Kidney Disease: Improving Global Outcomes (KDIGO) guidelines were used to diagnose acute kidney injury (AKI). During their AFI illness, a substantial number of patients (50.0%) developed AKI. Dengue exhibited the highest prevalence of AKI (66.7%) among all diagnoses. Stage 1 accounted for the preponderance of AKI cases in Dengue (60%), with a small number of Stage 2 (30%) and Stage 3 (10%) cases. Compared with Dengue, malaria had a lower prevalence of AKI (36.4%). 75% of the patients were classified as Stage 1, while 25% were classified as Stage 2. Malaria did not exhibit any Stage 3 AKI. Scrub Typhus exhibited a reduced prevalence of AKI (42.8%). The prevalence of AKI in scrub typhus was lower (42.8%) than that of dengue and malaria. Stage 1, the least severe form of AKI, was observed in all cases. Leptospirosis exhibited a high incidence of AKI, similar to dengue, at 75%. Nevertheless, the distribution was markedly different from that of Dengue, with a greater number of Stage 2 (50%) cases and fewer Stage 1 (33.3%) cases. In Leptospirosis, no Stage 3 AKI was observed. AKI was developed in a moderate proportion (38.5%) of unspecified cases. Classifying all these cases as Stage 1 indicated that they were associated with a less severe form of kidney injury.

Discussion

One of the most prevalent and potentially fatal complications associated with the treatment of Acute Febrile Illness (AFI) is Acute Kidney Injury (AKI). Therefore, it is imperative to promptly diagnose and treat this condition during the therapy of any acute febrile illness.

According to this study, just 40% of the cohort were female, and 60% were male. This notable male preponderance probably reflects variations in health-seeking behavior, exposure patterns, and even occupational dangers.[10] Males are more likely to engage in outdoor activity, such as farming, construction, or manual labor, in rural and semi-urban Indian contexts. This increases exposure to vectors such as mites (scrub typhus) and mosquitoes (dengue), as well as to contaminated water supplies (leptospirosis and enteric fever).[11]

The patients' average age was 54.6 years. The mean age of patients in a comparable study conducted in South India was 45.5 years for scrub typhus, 35.8 years for malaria, and 28.6 years for dengue. Twelve infectious diseases are a substantial cause of acute renal failure in tropical countries. Leptospirosis, falciparum malaria, and sepsis are among the most prevalent infections that result in acute renal failure. Diagnostic facilities are insufficient, which poses a challenge in determining the causes of acute renal failure.[12] In contrast to the 26% of unspecified fevers in our analysis, the aetiologies of the majority of cases (61.3%) in a study conducted by Leelarasamee et al,[13] on acute febrile illnesses were unknown. 5.7% of patients had dengue, 7.5% had scrub typhus, and 1.1% had leptospirosis, according to the same study. Our study, on the other hand, found these rates to be 30%, 14.0%, and 8.0%, respectively. In South India, Chrispal et al,[14] conducted a study in which 8% of cases were classified as unspecified fever and 7.3% as having no distinct diagnosis. Scrub typhus (47.5%), malaria (17.1%), enteric fever (8%), leptospirosis (3%), rickettsiosis (1.8%), and hantavirus (0.3%) were identified in individuals with acute febrile illness in their research.

Fever was the most prevalent clinical manifestation across all diagnoses with a high proportion of patients (92%) exhibiting it. Malaria (22 patients), Scrub Typhus (14 patients), Leptospirosis (8 patients), and unspecified causes (26 patients) were the most frequently diagnosed conditions in our study, with Dengue fever being the most prevalent (30 patients). The distribution of AFI in the study by Gopal Basu et al,[15] was as follows: scrub typhus (51.2%), falciparum malaria (10.4%), enteric fever (8.7%), dengue (7.6%), mixed malaria (6.5%), and leptospirosis (3.3%). The spectrum of TAFI in the study conducted by J.J. Nair et al. was as follows: vivax malaria (203, 33.8%), leptospirosis (151, 25.2%), dengue fever (85, 14.2%), falciparum malaria (49, 8.2%), mixed malaria (37, 6.2%), enteric fever (7, 1.2%), and scrub typhus (5, 0.8%).[16] Dengue was the most prevalent cause of AKI in this investigation, particularly in stage 1, and RRT was promptly implemented. Nevertheless, Basu G. et al,[15] identified scrub typhus as the most prevalent cause of AKI, followed by falciparum malaria. In contrast to studies by Bhandary et al,[17] Basu et al,[15] Saravu et al,[18] Kute et al,[19] and Gupta et al,[20] the proportions of malaria patients with AKI, severe AKI, RRT initiation, and in-hospital mortality varied. The greater number of patients in AKI stage 1 may be indicative of cases that are typically undiagnosed and asymptomatic and are more easily identified using the more sensitive KDIGO criteria. The study found that the maximum in-hospital mortality was associated with AKI stage 3.

Conclusion

Thus, this study shows that acute kidney damage is common across a range of acute febrile diseases and is important for promptly identifying and preventing its onset, which might lead to higher morbidity and death.

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Conflicts of interest

There are no conflicts of interest.

References

1. Susantitaphong P, Cruz DN, Cerda J, Abulfaraj M, Alqahtani F, Koulouridis I, et al.. World incidence of AKI: A meta-analysis. Clin J Am Soc Nephrol2013; 8: 1482-93.
2. Susilawati TN, McBride WJH. Acute undifferentiated fever in Asia: A review of the literature. Southeast Asian J Trop Med Public

Health. 2014;45(3):719–26.
3. Joshi R, Colford JM. Jr., Reingold AL, Kalantri S. Nonmalarial acute undifferentiated fever in a rural hospital in central India: diagnostic uncertainty and overtreatment with antimalarial agents. Am J Trop Med Hyg. 2008;78(3):393–99.
4. Animut A, Mekonnen Y, Shimelis D, Ephraim E. Febrile illnesses of different aetiology among outpatients in four health centers in Northwestern Ethiopia. Jpn J Infect Dis. 2009;62:107–10.
5. Kasper MR, Blair PJ, Touch S, Sokhal B, Yasuda CY, Williams M, et al. Infectious aetiologies of acute febrile illness among patients seeking health care in south-central Cambodia. Am J Trop Med Hyg. 2012;86(2):246–53.
6. Rezza G, Nicoletti L, Angelini R et al. Infection with chikungunya virus in Italy: an outbreak in a temperate region. Lancet 2007; 370:1840–1846
7. Zell R. Global climate change and the emergence/re-emergence of infectious diseases. Int J Med Microbiol 2004; 293: 16–26
8. Wilson ME, Freedman DO. Etiology of travel-related fever. Curr Opin Infect Dis 2007; 20: 449–453
9. Kidney Disease: Improving Global Outcomes (KDIGO) Acute Kidney Injury Work Group. KDIGO clinical practice guideline for acute kidney injury. Kidney Int. 2012; 2:1–138.
10. Joshi R, Colford JM Jr, Reingold AL, et al. Gender and the epidemiology of infectious diseases in developing countries. Soc Sci Med. 2005;60(4):703–71443.
11. Varghese GM, Janardhanan J, Trowbridge P, et al. Scrub typhus in South India: clinical and laboratory manifestations, and predictors of mortality. Int J Infect Dis. 2013;17(11):e988–e993
12. Jha V, Parameswaran S. Communitya cquired acute kidney injury in tropical countries. Nat Rev Nephrol 2013; 9:278-90.
13. Leelarasamee A, Chupaprawan C, Chenchittikul M, Udompanthurat S. Etiologies of acute undifferentiated febrile illness in Thailand. J Med Assoc Thail. 2004;87(5):464- 72.
14. Chrispal A, Boorugu H, Gopinath KG, Chandy S, Jude Prakash JA, Thomas EM, et al. Short Report Acute undifferentiated febrile illness in adult. Trop Doct. 2010; 49 (October):230-34.
15. Basu G, Chrispal A, Boorugu H, Gopinath KG, Chandy S, Prakash JA, et al. Acute kidney injury in tropical acute febrile illness in a tertiary care centre-RIFLE criteria validation. Nephrol Dialysis Transplant. 2010 Aug 11;26(2):524-31.
16. Nair JJ, Bhat A, Prabhu MV. A clinical study of acute kidney injury in tropical acute febrile illness. Journal of clinical and diagnostic research: JCDR. 2016 Aug;10(8):OC01.
17. Bhandary N. Occurrence and severity of acute renal failure in malaria. Int J Biomed Res. 2011;2(5):280-84.
18. Saravu K, Rishikesh K, Parikh CR. Risk factors and outcomes stratified by severity of Acute Kidney Injury in malaria. PLoS ONE. 2014;9(3).
19. Kute VB, Shah PR, Munjappa BC, Gumber MR, Patel H V, Jain SH, et al. Outcome and prognostic factors of malaria-associated acute kidney injury requiring hemodialysis: A single-center experience. Indian J Nephrol. 2012;22(1):33– 38.
20. Gupta BK, Nayak KC, Kumar S, Kumar S, Gupta A. Oliguric and non-oliguric acute renal failure in malaria in the west zone of Rajasthan, India-A comparative study. J Acute Dis. 2012;100–06.