



Original Research Article

A PROTOCOL FOR EVALUATION AND MANAGEMENT IN PATIENTS WITH ACUTE UNDIFFERENTIATED FEVER IN THE EMERGENCY DEPARTMENT - A PROSPECTIVE OBSERVATIONAL STUDY

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ABSTRACT

Background: Acute undifferentiated febrile illness (AUF) is a common and diagnostically challenging presentation in emergency departments in resource-limited settings. **Objective:** This study aimed to derive a protocol for the evaluation and management of AUF and to describe the clinical and laboratory profile of patients presenting with AUF at a tertiary care center.

Materials and Methods: We conducted a prospective observational study consisting adults (>18 years) presenting with fever without localizing signs were enrolled. Basic investigations (CBC, renal and liver function tests) were performed in early fever (1–2 days), while etiologic testing (Dengue, Scrub typhus, Malaria, Typhoid, Leptospirosis) was performed according to duration of fever. Data were entered and analyzed using Microsoft Excel.

Results: A total of 79 patients were enrolled. Mean age was 36.74 years (SD 23.65); median 33.0 years. Gender distribution was 42 males (53.2%), 34 females (43.0%), and 3 patients (3.8%) with missing gender data. Dengue NS1 was positive in 21 of 71 patients tested (29.58%). Dengue IgM was positive in 22 of 69 (31.88%). Scrub typhus IgM was positive in 24 of 68 (35.29%). Leptospira testing showed 0 positives among 27 tested. Median duration of hospital stay (n=64) was 4.98 days. Most patients (74 of 79) were discharged from hospital.

Conclusion: In this single-center prospective cohort of patients presenting with AUF, dengue and scrub typhus were important identifiable etiologies. These findings support an evidence-based, time-stratified testing and management protocol in the emergency department to guide early diagnostics and antimicrobial stewardship.

Keywords: Acute undifferentiated febrile illness, Emergency medicine, Tropical infections, Dengue, Scrub typhus.

INTRODUCTION

Acute undifferentiated febrile illness (AUF) presents a major diagnostic challenge in emergency departments, especially in resource-limited

settings.^[1] Common infectious causes include Dengue, Scrub typhus, Malaria, Enteric fever and Leptospirosis. The present study was designed to derive a protocol for systematic evaluation and management of AUF in the emergency department

and to describe the clinical and laboratory spectrum of patients presenting with AUFI at our center.^[2-4]

MATERIALS AND METHODS

Study design and setting:

This prospective observational study was conducted in the Emergency Department of a tertiary care teaching hospital. Adult patients presenting with acute undifferentiated febrile illness (AUFI) were evaluated using a standardized diagnostic and management protocol derived for this study.

Inclusion and exclusion criteria:

We included adults aged ≥ 18 years presenting with fever of ≤ 14 days' duration without any localizing clinical signs or established etiology at the time of presentation. Patients were excluded if they had a clearly identifiable source of fever on initial evaluation, had chronic febrile illness, were immunocompromised, or declined consent.

Clinical evaluation:

All eligible patients underwent a detailed history and physical examination. The duration of fever was recorded to guide time-stratified diagnostic testing. Vital signs, systemic examination findings, and comorbidities were documented in a structured case record form.

Diagnostic protocol:

A stepwise investigation algorithm was used.

- **Early fever (1–2 days):** Basic laboratory investigations (complete blood count, liver and renal function tests) were performed.
- **Intermediate duration (3–5 days):** Pathogen-specific tests were conducted depending on expected serological positivity windows, including Dengue NS1/IgM, Scrub typhus IgM, Malaria rapid test (Pf/Pv), Widal/enteric fever testing, and Leptospira IgM.
- **Prolonged fever (>5 days):** Additional evaluations such as blood culture and extended diagnostics were performed as indicated.

All laboratory tests were performed in the hospital's certified diagnostic laboratory.

Management protocol:

Patients received symptomatic care, hydration, and empiric antibiotics only when clinically indicated. Targeted therapy (e.g., doxycycline for suspected rickettsial infection) was initiated based on laboratory confirmation or strong clinical suspicion. Disposition decisions (discharge, ward admission, ICU

admission) were made as per the ED physician's clinical judgment.

Data collection:

Data on demographics, clinical features, investigations, treatment, and outcomes were recorded prospectively in a structured data sheet and subsequently transferred into Microsoft Excel for analysis. Missing or unclear entries were cross-checked with case files whenever possible.

Statistical analysis:

Data were analyzed using Microsoft Excel. Continuous variables were summarized as mean \pm standard deviation (SD) or median with interquartile range (IQR) depending on distribution. Categorical variables were presented as frequencies and percentages. No inferential statistics were performed as this study primarily aimed to describe the clinical and etiological profile of AUFI.

RESULTS

A total of 79 patients presenting with acute undifferentiated febrile illness were enrolled in the study. The mean age of the cohort was 36.7 ± 23.6 years, with a median of 33 years (range 1–89 years). Of the total participants, 53.2% were male ($n = 42$) and 43.0% were female ($n = 34$), while 3 patients (3.8%) had missing gender data. The majority of patients presented within the first five days of illness, and comorbidities were uncommon.

Basic laboratory investigations were performed for all patients. Etiology-specific tests were conducted depending on the duration of fever. Among the 71 patients tested for Dengue NS1 antigen, 21 (29.6%) were positive. Dengue IgM antibody was positive in 22 of 69 patients (31.9%), while Scrub typhus IgM was positive in 24 of 68 tested individuals (35.3%). None of the 27 patients tested for Leptospira IgM were positive. Malaria rapid tests were rarely positive, with no confirmed parasitemia recorded in the dataset. Overall, dengue and scrub typhus were the two predominant laboratory-confirmed etiologies identified during the study period.

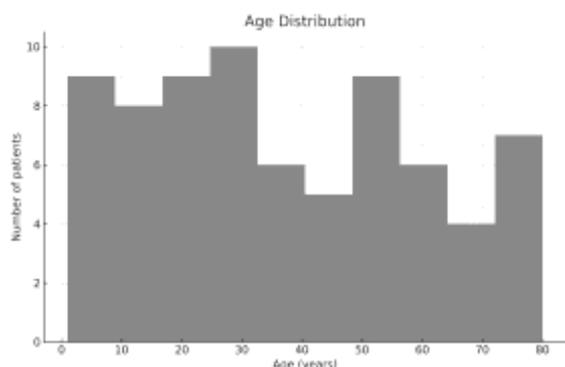
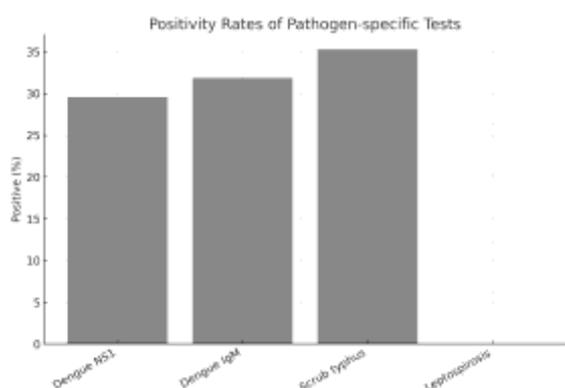
The duration of hospital stay was available for 64 patients. The mean length of stay was 4.98 days, with most patients recovering uneventfully. A total of 74 patients (93.7%) were discharged from the hospital, while the remaining either left against medical advice or required extended evaluation. No mortality was recorded in this study.

Table 1: Demographic and Clinical Profile of Patients with AUFI (n = 79)

Parameter	Value
Total patients	79
Mean age (years)	36.74
Median age (years)	33.00
SD of age	23.65
Male	42
Female	34
Missing gender	3

Table 2: Laboratory Investigation Findings and Etiologic Yield

Test	Tested (n)	Positive (n)	Positive (%)
Dengue NSI	71	21	29.58%
Dengue IgM	69	22	31.88%
Scrub typhus IgM	68	24	35.29%
Leptospirosis IgM	27	0	0.00%

**Figure 1: Age Distribution Histogram****Figure 2: Positivity Rates of Pathogen-Specific Tests**

DISCUSSION

This single-center prospective study provides a snapshot of etiologies among adults presenting with AEFI in our emergency department. Dengue and Scrub typhus were the most frequently identified etiologic agents among those tested. These findings support the use of a time-stratified testing protocol in the emergency department to improve diagnostic yield and limit unnecessary antibiotic use. Limitations include single-center design, modest sample size, missing data in some fields, and reliance on serologic test results without molecular confirmation.

Strengths and Limitations

This study has several strengths. It prospectively enrolled patients presenting with acute undifferentiated febrile illness using a structured and time-stratified diagnostic protocol, ensuring uniform evaluation and reducing variability in clinical decision-making. The study reflects real-world Emergency Department practice in a tertiary-care setting, and includes simultaneous assessment of multiple regionally relevant pathogens such as dengue, scrub typhus, malaria and leptospirosis, providing valuable epidemiological insight for the

region. The use of a standardized data collection sheet minimized information gaps and enhanced internal validity. However, the study also has limitations. The sample size was modest and derived from a single centre, which may limit generalizability. Several laboratory confirmations relied on rapid serological assays, which have known sensitivity and specificity constraints, particularly early in the disease course. Some clinical and laboratory variables had missing entries, and blood cultures or molecular diagnostic tests were not uniformly performed, reducing etiologic yield for certain pathogens. Seasonal variation was not accounted for due to the limited study duration. Despite these limitations, the study provides useful preliminary evidence to guide protocol-based evaluation of AEFI in emergency settings.

CONCLUSION

Dengue and Scrub typhus were leading identifiable causes among adults presenting with AEFI in this cohort. A protocol-based approach may help guide focused diagnostic testing and management in the emergency department.

Conflict of Interest: None

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Approval of Institutional Ethical Review Board

This study was approved by the Institutional Ethical Research Committee vide letter no: SRHU/HIMS/E-1/2025/120 dated 28 April 2025.

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Authors' Contributions

KT conceived the study, developed the study protocol, supervised data collection, and contributed to manuscript drafting. MS coordinated patient recruitment, ensured adherence to the diagnostic protocol, and assisted with data acquisition. HB performed data cleaning, conducted preliminary data analysis, and contributed to interpretation of findings. NS provided clinical oversight in the Emergency Department, reviewed patient records, and contributed to refining the methodology. SK & MSH performed statistical analysis, prepared tables and figures, and contributed to writing and critical revision of the manuscript. All authors reviewed and approved the final manuscript.

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