Evaluation of Acute Febrile Illness in Patients Presenting to a Tertiary Care Hospital

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ABSTRACT

BACKGROUND
The infectious causes and epidemiology of acute febrile illness (AFI), defined as illness of < 1 week duration with no identified source, remain poorly characterized in many parts of the world. We wanted to explore the reasons for AFI, their clinical range and the regular pattern as the year progressed.

METHODS
This is a prospective cross-sectional analytical study conducted from August 2018 to February 2019 in the Department of Medicine, Bidar Institute of Medical Sciences (BRIMS), Bidar, North Karnataka. Patients with fever of unknown origin for 2–7 days duration were tested for Leptospirosis, Malaria, Rickettsial disease, Dengue virus, and Chikungunya virus. Blood culture tests were also done. SPSS Version 22 was used to analyse the data. Chi-square test was applied wherever necessary and p-value of <0.05 was considered statistically significant.

RESULTS
Among the 200 enrolled patients, 57 had Dengue fever, 44 Enteric fever, 34 Chikungunya, 17 Leptospirosis, 14 Scrub-Typhus and 3 had Malaria. Mixed infection was seen in 26 cases. In our investigation, AFI happened most ordinarily during stormy and fall seasons. The current study revealed that the burden of Dengue, Enteric fever, Chikungunya, Leptospirosis and Scrub-Typhus disease is more in the current population.

CONCLUSIONS
Laboratory and research facility based syndromic information of AFI can make clinicians cautious with respect to the potential pathogens in neighbourhood. This in turn guides us to set up the epidemiologic database of various aetiologies related to AFI in this particular region.

KEY WORDS
Acute Febrile Illness, Bidar, Dengue Fever, Aetiology, Scrub Typhus
Infectious illness are driving reasons for morbidity and mortality in tropical and developing nation like India. The term acute febrile illness (AFI) characterized as ailment of <1 week term with no recognized source and with no proof of organ or system explicit aetiology. In acute febrile illness, even though symptoms are nonspecific, patients may present with common features like acute onset of fever, chills, myalgia and fatigue which represent many infections that are endemic in India. The aetiologies of AFI incorporate conceivable remarkable contaminations, for example, intestinal sickness, enteric fever, Rickettsiosis, Leptospirosis, Brucellosis, Scratch Typhus, Malaria, Dengue fever, Chikungunya and Japanese encephalitis.

In numerous territories of prospering nations, where diagnostic provisions are restricted, AFI remain to a great extent obscure. With no point of convergence of disease, making its conclusion and the executivs is a difficult issue. Doctors frequently analyse patients hypothetically dependent on clinical highlights and suppositions with respect to circling pathogens.

Thus, knowledge of local prevalence of infectious diseases is mandatory in order to target clinical work up and treatment. There are only a limited number of studies from Karnataka reporting on the aetiology of fever and relatively weak epidemiological data are not available.

With this background, we aimed to conduct a hospital based prospective study to investigate and evaluate the causes and aetiology of AFI, and their clinical spectrum among patients in teaching hospital of North Karnataka.

This cross sectional study was conducted from August 2018 to February 2019 in the Department of Medicine of 750 bedded Teaching hospital of Bidar Institute of Medical Sciences (BRIMS) Bidar of North Karnataka. The study population consisted patients from urban and rural area of Bidar visiting to Outpatient Department of Medicine complaining of acute fever not less than three days with no evident focus of infection.

A total of 200 patients aged 13 and above were included in the study. Brief history about the illness and patient details like age, sex and address were recorded. After thorough general physical examination, the findings were entered on a standard data collection sheet. This study protocol was approved by Institute’s Ethics Committee, and samples were collected after obtaining informed consent from the patients.

The sample size (n=200) was estimated with an expected prevalence of pyrexia of unknown origin as 15% with 4% absolute precision and 95% confidence interval. An interim analysis was carried out and the estimate from the interim analysis was used to modify the sample size. Convenience sampling method was adapted to carry out this study.

Exclusion Criteria
Patients with haematological malignancies, autoimmune disorders, and those on immuno suppressants were eliminated from the study.

Blood specimen was procured from the patients to perform the standard benchmark examinations like complete blood picture analysis, serum electrolytes, and liver and renal function tests.

Microbiological Investigations
- A thick and thin smear was performed to recognize malarial parasites.
- A solo blood culture in BHI bottle for culture and antibiotic sensitivity testing.
- Rapid Dengue test to detect NS1Ag and anti-dengue IgM and IgG antibodies.
- Enzyme-linked immunosorbent assay (ELISA) tests after the 7th day of fever if tests for malarial parasites and blood cultures are negative. These include dengue IgM ELISA, Chikungunya IgM ELISA, Leptospira IgM ELISA. Weil Felix test for Scrub Typhus was done by tube agglutination method. Antibodies from patients serum was tested against antigensOX-19 for Endemic Typhus,OX-2 for spotted fever andOX-K for Scrub Typhus. Titer of 1:160 and above was considered significant. Widal tube agglutination test was done from patient’s serum. Antibodies from patient’s serum against Salmonella typhi and Salmonella paratyphi antigens were detected. Salmonella typhi O, Salmonella typhi H, Salmonella paratyphi AH and Salmonella paratyphi BH antigens were included. A titre of 100 or more for O antigen is considered significant and a titre in excess of 200 for H antigens is considered significant.

Recovering serological testing following a month was performed if the underlying serological finding is vague and if the patient is willing.

Statistical Analysis
Statistical software package SPSS version 22 (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp) was used to analyse the data. Chi-square test was applied wherever necessary and p-value of <0.05 was considered statistically significant.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Disease</th>
<th>Positive Cases</th>
<th>Percentage Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dengue</td>
<td>57</td>
<td>28.5</td>
</tr>
<tr>
<td>2.</td>
<td>Enteric fever</td>
<td>44</td>
<td>7</td>
</tr>
<tr>
<td>3.</td>
<td>Chikungunya</td>
<td>34</td>
<td>16.5</td>
</tr>
<tr>
<td>4.</td>
<td>Leptospirosis</td>
<td>17</td>
<td>8.5</td>
</tr>
<tr>
<td>5.</td>
<td>Scrub typhus</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>6.</td>
<td>Malaria</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>7.</td>
<td>Mixed infection-Dengue and Chikungunya</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>8.</td>
<td>Mixed infection-Dengue and scrub-typhus</td>
<td>9</td>
<td>4.5</td>
</tr>
<tr>
<td>9.</td>
<td>Mixed infection-Malaria and scrub-typhus</td>
<td>3</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Table 1. Distribution of Acute Febrile Illness Cases along with Aetiologies

200 patients were assessed in all. Of these, 123 (61.5%) were males and 77 (38.5%) were females. Out of 200 cases, 31 (15.5%) cases were undiagnosed for any of AFI like Dengue, Chikungunya, and Enteric fever, Scrub-typhus, Malaria and Leptospirosis. Among 84.5% Diagnosed cases, Dengue (57 cases – 28.5%) was the predominant disease reported in the affected population. In decreasing order follow by Enteric...
fever (44 cases - 22%), Chikungunya (34 cases - 17%), Leptospirosis (17 cases - 8.5%), Scrub Typhus (14 cases - 7%) and Malaria (3 cases - 1.5%). [Table 1] Mixed infection was reported in 26 (13%) affected cases, out of which 14 cases reported mixed infection with Dengue and Chikungunya (7%). In decreasing order of mixed infection by Dengue and Scrub Typhus (9 cases - 4.5%) and Malaria and Scrub Typhus (3 cases - 1.5%).

![Aetiological Pattern of Acute Febrile Illness](image)

The current study revealed that the burden of Dengue, Enteric fever, Chikungunya, Leptospirosis and Scrub-Typhus disease is more in the current population. Previous studies conducted in different parts of India (northern and southern parts) reported similar results. A study was conducted in Uttarakhand by Singh R et al.5 also showed that the diseases Dengue, Chikungunya, Enteric fever and Malaria are the most common etiological agents of Acute Febrile Illness. A study conducted by Abrahamsen et al.6 in southern India reported that majority of Acute Febrile Illness are bacterial infections, (34%) out of which 19% of Acute febrile illness are Tuberculosis. Another study conducted in Eastern India reported that majority of Acute Febrile Illness are tuberculosis (53%) followed by neoplasms (17%) and collagen vascular disorders (11%).7

Combined contamination with more than one etiological agent can bring about an ailment with covering indications, bringing about a circumstance where the detection and the handling of such a patient could be demanding for the treating physician.8-12 Side effects of one illness may copy with other diseases which are additionally common around there. Along these lines, patients giving intense febrile sickness ought not be ventured to experience the ill effects of single contamination alone. The clinician ought to explore completely to search for different reasons for fever.

The aetiology of Acute Febrile Illness are region and country specific. Acute Febrile Illness causes significant mortality and morbidity across the India. Deaths due to acute febrile illness are preventable.13 In the present study, AFI are most normal during stormy and harvest time seasons. The dormant water because of downpours aggravated by poor seepage framework in a large portion of the regions in growing nations turns into a rearing ground for the mosquitoes helping them to transmit the ailments. Occasional upsurge in fever is likewise an outstanding documentation in the preceding studies.14,15 The precise finding of AFI is entangled by an absence of information about local pathogens, existence of comparative signs and manifestations and inaccessibility of the broad diagnostic panel prompting to mismanagement of AFI cases. The infectious operators causing AFI fluctuates by various regions proposing that the diagnosis and management should be founded on a deliberate assessment of territory explicit aetiologies dependent on the laboratory based syndromic observation.

### CONCLUSIONS

The comparability in clinical signs, decent variety of etiological agents, absence of complete diagnostic panel represents an incredible test to clinicians in managing AFI cases in Bidar. The etiological profile will be useful in the advancement of balanced rules for control and treatment of AFI.

### REFERENCES


