

## Research Article

# Clinico – Etiological profile of Acute Undifferentiated fever in children 6months - 15 years

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**Abstract:** **Introduction:** Acute febrile illness (AFI) is defined as a patient with fever of 38°C or higher at presentation or history of fever that persisted for 2–14 days with no localizing source. Fever is the main clinical symptom of various tropical infectious diseases. The objectives were to evaluate the microbiological aetiology of acute febrile illness (AFI) in pediatric patients using serological and bacterial cultures and to understand the clinical profile of acute febrile illness in pediatric patients. **Methods:** This is a Hospital based prospective and observational study present study emphasizes on the infective aetiologies of Acute Undifferentiated fevers with special emphasis on clinical and demographic features among patients admitted in a teaching hospital. All adult patients (≥18 years) admitted to the hospital with fever of less than 21 days duration, with temperature ≥38° C upon admission and non-detection of any specific foci of infection by history, physical examination and routine investigations were included. **Results** In present investigation, an aggregate of 110 patients with intense identical fever were assessed out of these 59 (53.6%) were male and 51 (46.4%) were female. In this investigation typhoid fever was the most well-known reason for undifferentiated fever (30.0%) trailed by malaria (21.7%), dengue fever (18.1%), urinary tract disease (14.5%), Acute gastroenteritis (14.5%), Pneumonia (9.0%), Bronchiolitis (4.5%), Hepatitis (1.7%) and Pharyngotonsillitis (0.9%). **Conclusion:** Our data showed that the etiologic spectrum of acute undifferentiated fever was widely distributed in our region. Scrub typhus was the major cause of acute undifferentiated fever next to Dengue and Enteric fever. There were a bulk of cases which were not diagnosed and put under miscellaneous aetiology of fever, this made the second largest group in our study next to the Scrub Typhus group.

**Keywords :** Acute Undifferentiated Fever, Dengue, Enteric fever, Malaria, Scrub typhus.

## INTRODUCTION

Acute febrile illness (AFI) is defined as a patient with fever of 38°C or higher at presentation or history of fever that persisted for 2–14 days with no localizing source. Fever is the main clinical symptom of various tropical infectious diseases. <sup>[1]</sup> Like other developing nations, India with limited resources, is facing lots of health effects due to climate change, including vector borne and water borne diseases such as leptospirosis, dengue and malaria, enteric fever etc with significant level of morbidity and mortality in the patients suffering during this period. A significant number includes mixed infections with the previously mentioned agents, while a few others still remain unidentified. <sup>[2]</sup>

As an initial move towards the improvement of calculations that could control clinical administration of intense febrile ailments, it is essential to decide the study of disease transmission and clinic etiological and lab profile of the intense febrile ailments. <sup>[3]</sup> Fever is known to be the most common symptom in any systemic illness and has a huge role to play in morbidity. Every year, different parts of the world are affected by seasonal fevers. <sup>[4]</sup>

Acute febrile illness (AFI) is classically defined as fever <2 weeks, rapid onset, caused by diverse pathogens without any system or organ-specific

aetiology. Due to overlapping clinical presentation and limited microbiological services available in many low resource areas, very few patients receive an accurate and specific diagnosis at the community level, the relative importance of various causes of fever remains unknown. <sup>[5]</sup>

Fever in children signifies systemic inflammation, typically in response to a viral, bacterial, parasitic, or less commonly, a non-infectious aetiology. Geographic settings and patients' ages can help point to the appropriate diagnosis and treatment if local epidemiology is well understood. AFI can be potentially fatal if the aetiology is not recognised and if not appropriately treated early. <sup>[6]</sup>

Mostly seen in the tropical and subtropical regions, AFI has the highest incidence in childhood-majority between 4 and 5 years of age. In tropical countries like India, the most common reasons for AFI are Dengue, Malaria, Typhoid fever, Leptospirosis and Rickettsial infection. Acute respiratory infections and viral exanthematous fevers also affect children significantly. Population density and urbanisation may contribute to the emergence and re-emergence of some of these diseases in tropical regions. <sup>[7]</sup>

In tropical countries, malaria is frequently the cause of AFI followed by other non-malarial reasons. Viral respiratory tract infections are more seen in middle east countries. [8] The most critical issue for primary-care physicians is to focus on the fever's aetiology and to rule out serious diseases. Distinguishing a patient with viral illness from one with bacterial infection is essential as there may be considerable overlap in the clinical appearance. [9]

Due to uncertainties and shortage of data in this field, clinical decision-making often gets compromised. There is deficiency of data in pediatric age group regarding AFI. Understanding the pattern of AFI and decoding various clinical and diagnostic clues will help to identify the aetiology, thereby expediting the treatment process. [10] In this context, we have conducted a cross-sectional retrospective study to determine the prevalence of local infectious diseases causing AFI in our geographical area. The objectives were to evaluate the microbiological aetiology of acute febrile illness (AFI) in pediatric patients using serological and bacterial cultures and to understand the clinical profile of acute febrile illness in pediatric patients.

## MATERIALS AND METHODS

This is a Hospital based prospective and observational study present study emphasizes on the infective aetiologies of Acute Undifferentiated fevers with special emphasis on clinical and demographic features among patients admitted in a teaching hospital.

**Inclusion criteria:** All adult patients ( $\geq 18$  years) admitted to the hospital with fever of less than 21 days duration, with temperature  $\geq 38^\circ$  C upon admission and non-detection of any specific foci of infection by history, physical examination and routine investigations.

**Exclusion criteria:** Previously diagnosed cases of, Known fevers Collagen vascular disorders,

Endocrine disorder, Malignancies Immunodeficient states, Fever of duration  $\geq 21$  days, Drug induced fever.

**Data entry and analysis:** The data was entered in Microsoft Excel and analysed using Epi Data analysis V2.2.2.186 and STATA 12.0 software. The continuous variables like age, duration of fever and ESR at 1 hour were reported as Mean (SD) or median (Inter Quartile Range) based on distribution of data. The categorical variables such as gender, presence of symptoms (myalgia, jaundice, haemorrhage, conjunctival congestion, diarrhoea and cough or dyspnoea), test results (malaria slide examination, RDT for malaria, thyroid function test, sputum examination, dengue, scrub typhus, leptospirosis, Widal test, blood culture, urine culture, HIV, HCV, Hbs Ag), finding from chest X ray, USG findings and final diagnosis of undifferentiated fever were reported as proportions. In comparison analysis, the final diagnosis categories with less number of patients were excluded from analysis. The association between continuous variables [age, duration of fever and ESR at 1 hour] and the final diagnosis of undifferentiated fever were assessed using one way ANOVA or Kruskal Wallis test and the association between categorical variable and the final diagnosis of undifferentiated fever were assessed using Chi Square test or Fisher's exact test based the cell values. The p value of  $<0.05$  was considered for statistical significance.

**Ethical consideration:** The ethical approval for the study was obtained from the Institute Ethical committee of Medical College and Hospital. All ethical principles were adhered in the study.

**Data collection:** All participants were briefed about the study in the language they comprehend and their willingness to participate in the study was obtained through informed consent form. Detailed clinical history was obtained from the selected patients and a thorough physical examination done for each. Blood, urine and sputum samples were taken from the study group and sent for the following investigations accordingly:

## RESULTS

In present study, a total of 110 patients with acute undifferentiated fever were evaluated out of these 59 (53.6%) were male and 83 (46.4%) were female (table-1)

**Table 1:** Distribution of gender

Gender	No. of patients	Percentage
Male	59	53.6
Female	51	46.4
Total	110	100

**Table 2:** Distribution of different age groups of patients

Age	No. of patients	Percentage
<4 years	27	24.6
5-10 years	43	39.0
11-14 years	40	36.4

Total	110	100
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In table 2, in our study, the most of the patients the age group of 5-10 years i.e., 43 out of 110(39.0%), followed by 11-14 years, i.e., 40 out of 110 (36.4%).

**Table 3: Clinical Symptoms and sign**

Clinical Symptoms and sign	No. of patients	Percentage
Pyrexia	110	100
Cough and Cold	59	53.6
Abdominal Pain	11	10.0
Diarrhoea	22	20.0
Vomiting	10	9.3
Headache	05	4.5
Hepatomegaly	2	1.8
Splenomegaly	1	0.9

In table-3, out of 110 patients, most common symptom was pyrexia (100%), Cough and Cold (53.6%), Abdominal Pain (10.0%), Diarrhoea (20.0%), vomiting (9.3%), headache (4.5%), hepatomegaly (1.8%) and splenomegaly (0.9%).

**Table 4: Acute febrile illness aetiology**

Final aetiology	No. of patients	Percentage
Typhoid	33	30.0
Malaria	24	21.7
Dengue	20	18.1
Acute Gastroenteritis	16	14.5
Pneumonia	10	9.0
Bronchiolitis	5	4.5
Hepatitis	2	1.7
Pharyngotonsillitis	1	0.9

In table 4, in this study typhoid fever was the most common cause of undifferentiated fever(30.0%) followed by malaria (21.7%), dengue fever (18.1%), Acute gastroenteritis (14.5%), Pneumonia (9.0%), Bronchiolitis (4.5%), Hepatitis (1.7%) and Pharyngotonsillitis (0.9%).

**Table 5: Treatment of Acute Undifferentiated fever in children**

Final aetiology	No. of patients	Percentage
Ceftriaxone	49	44.5
Chloroquine	16	14.5
Doxycycline only	18	16.3
Ceftriaxone or Azithromycin	19	17.2
Doxycycline or Azithromycin	8	7.5

In table 5, treatment-Enteric fever was treated with Ceftriaxone. Chloroquine was used for treatment of Malaria. Dengue was treated symptomatically and with fluids according to Dengue protocol. If fever persisted even after 6 days of antibiotics, then Azithromycin was added. In the undiagnosed fever category, received empirical antibiotics

## DISCUSSION

Fever is one of the most important clinical signs. Fever of unknown origin (FUO) was first defined by Petersdorf and Beeson in 1961 as a temperature above 38.30C (101.0F) on several occasions over a period of more than 3 weeks, for which no diagnosis has been reached despite 1 week of inpatient investigation. Infection still remains the most common cause of FUO all over the world even though the demographics may vary from region to

region. This was followed by connective tissue disorders (12%) and malignancies (12%).<sup>[11]</sup>

In the developing countries acute febrile illness is mostly due to infectious aetiology, either due to dengue or malaria. Investigation and treatment is then decided accordingly. In India, although about 100 million individuals are investigated for malaria by microscopy every year, as per the official estimates only less than 2% of them are slide positive. The annual slide positivity in malaria endemic countries is estimated to be about 5% (6

million confirmed cases of 128 million individuals investigated in 43 countries).<sup>[12]</sup>

A similar study in central India on Non malarial Acute Undifferentiated (NMAUF) cases revealed that about 39.9% patients with acute febrile illness received unnecessary treatment with antimalarial drugs.<sup>[13-16]</sup> However our study indicates dengue as the most common cause for fever followed by malaria, hepatitis, leptospirosis and tuberculosis. No cases of scrub typhus were reported from our region. The regional prevalence of pathogens and their chances of exposure to the local people influence the disease pattern. Hence it is important to study the diseases endemic to the region to avoid unnecessary wasting of resources and finances by subjecting the patients to unnecessary laboratory investigations.

## CONCLUSION

In conclusion, despite AUF being common, studies regarding its epidemiology are limited. In our study, serology is the most common diagnostic tool and the most prevalent aetiologies of AUF are Scrub Typhus, Dengue and Enteric fever.

Our data showed that the etiologic spectrum of acute undifferentiated fever was widely distributed in our region. Scrub typhus was the major cause of acute undifferentiated fever next to Dengue and Enteric fever. There were a bulk of cases which were not diagnosed and put under miscellaneous aetiology of fever, this made the second largest group in our study next to the Scrub Typhus group. This bulk of cases are a reflection of how much more we need to improve our clinical and diagnostic methodologies in order to make a prompt and accurate diagnosis in spite of all the currently available methods.

The clinical evaluation of the subjects recruited for this study has not revealed any predictor symptoms or specific risk factors to differentiate between the different causes of AUF. The lack of a widely agreed upon definition of AUF makes comparison of patients with AUF between regions and countries difficult. Further studies need to be conducted using a standard definition of AUF by evaluating patients clinically and serologically for detecting infectious diseases.

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