Original Research Article

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

Ramesh Dasari¹, Kadukuntla Swapna Reddy¹,*, Alekhya Nimmagadda¹, Sivani Saraswathi Kuruvada¹, Nuguri Sneha¹, S Srikrishna¹

¹ Dept. of Paediatrics, Apollo Institute of Medical Sciences and Research, Jubilee Hills, Jubilee Hills, Hyderabad, Telangana, India

1. 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.

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.

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 clinical etiological and lab profile of the intense febrile ailments.

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2. Aim and Objectives

Point of our examination is to decide segment factors, manifestations, signs and etiology of intense undifferentiated fever among hospitalized youngsters matured a half year to 15 years and to depict the exhibition of standard analytic techniques.

3. Materials and Methods

Review observational examination was led after endorsement from the Institutional Ethics Committee in Paediatric division, Apollo General Hospital, AIMSRI, Jubilee hills from January 2016 till December 2019.

3.1. Inclusion criteria

All the patients who were conceded in the ward or emergency unit difficulties of intense febrile sicknesses, patients a half year to 15 years old were remembered for the investigation.

3.2. Exclusion criteria

Patients with associated infections when the complications cannot be attributed to febrile illness or patients with haematological malignancies, autoimmune disorders, and those on immunosuppressant were excluded from the study.

3.3. Case definition

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.

Details of history and results of a thorough physical examination were entered on a standard data collection sheet.

The routine baseline investigations included complete blood count analysis, serum electrolytes, liver and renal function tests.

Reports of thick/thin smear performed to detect malarial parasites, enzyme linked immunosorbent assay (ELISA) tests performed for agents believed to be endemic to the region like dengue IgM ELISA, leptospira IgM ELISA and Widal test or Leptospirosis PCR. Dengue PCR report if available were entered in case record sheet. Blood culture was done by Bactec method.

3.4. Statistical analysis

CHI SQUARE test was utilized to evaluate contrasts between extents.

4. Results

In present investigation, a sum of 290 patients with intense undifferentiated fever were assessed out of these 157 (63%) were male and 133 (36.6%) were female (Table 1).

| Gender  | No. of patients | Percentage |
|---------|----------------|------------|
| Male    | 157            | 63.3       |
| Female  | 133            | 36.6       |
| Total   | 290            | 100        |

In Table 2, in our study, the most of the patients the age group of 3-5 years i.e., 91 out of 290 (21.3%), followed by 6-10 years, i.e., 73 out of 290 (25.1%).

| Age                  | No. of patients | Percentage |
|----------------------|----------------|------------|
| 6 months-2 years     | 62             | 21.3       |
| 3-5 years            | 91             | 31.3       |
| 6-10 years           | 73             | 25.1       |
| 11-15 years          | 64             | 22.0       |
| Total                | 290            | 100        |

In Table 3 out of 290 patients, most common symptom was pyrexia (100%), headache (54.8%), rhinitis (46.8%), vomiting (40.3%), Rash (32.0%), Abdominal Pain (26.8%), Diarrhoea (19.6%), Cough (10.6%), hepatomegaly (3.7%) and splenomegaly (3.1%).

| Clinical Symptoms and sign | No. of patients | Percentage |
|----------------------------|----------------|------------|
| Pyrexia                    | 290            | 100        |
| Headache                   | 159            | 54.8       |
| Rhinitis                   | 136            | 46.8       |
| Vomiting                   | 117            | 40.3       |
| Rash                       | 93             | 32.0       |
| Abdominal Pain             | 78             | 26.8       |
| Diarrhoea                  | 57             | 19.6       |
| Cough                      | 31             | 10.6       |
| Hepatomegaly               | 11             | 3.7        |
| Splenomegaly               | 9              | 3.1        |

In Table 4, in this investigation typhoid fever was the most well-known reason for undifferentiated fever (33.7%) trailed by malaria (25.5%), dengue fever (19.6%), urinary tract disease (8.2%), Acute gastroenteritis (5.5%),

| Final aetiology          | No. of patients | Percentage |
|--------------------------|----------------|------------|
| Typhoid                  | 98             | 33.7       |
| Malaria                  | 74             | 25.5       |
| Dengue                   | 57             | 19.6       |
| UTI                      | 24             | 8.2        |
| Acute Gastroenteritis    | 16             | 5.5        |
| Pneumonia                | 9              | 3.1        |
| Bronchiolitis            | 7              | 2.4        |
| Hepatitis                | 3              | 1.0        |
| Pharyngotonsillitis      | 2              | 0.6        |
Pneumonia (3.1%), Bronchiolitis (2.4%), Hepatitis (1.0%) and Pharyngotonsillitis (0.6%).

Table 5: Laboratory findings of acute Undifferentiated fever in children

| Variable                  | No. of patients | Percentage |
|---------------------------|-----------------|------------|
| Anaemia                   |                 |            |
| Mild (Hb in gm/dl)        | 196             | 67.5       |
| Moderate (7-10)           | 93              | 32.0       |
| Severe (<7)               | 1               | 0.3        |
| WBC count (>11,000)       | 74              | 25.1       |
| Count (cells/cumm)        | 21              | 7.2        |
| <4000                     | 195             | 67.2       |
| Platelets count           |                 |            |
| 1,00,000-1,50,000         | 77              | 26.5       |
| 1,50,000-2,000            | 162             | 55.8       |
| <50,000                   | 51              | 17.5       |
| Urine Culture             | 24              | 8.2        |
| Blood Culture             | 3               | 1.0        |
| Blood Widal               | 98              | 33.7       |
| Dengue Testing            | 57              | 19.0       |
| Bilirubin                 | 3               | 1.0        |
| SGOT >                    | 91              | 31.3       |
| ALP                       | 93              | 32.0       |
| SGPT                      | 86              | 29.6       |

In Table 5, regarding the hematological and biochemical boundaries, connection with hemoglobin level was Mild in the vast majority of the cases. The connection with leukopenia if there should be an occurrence of malaria and dengue. We saw between the seriousness of thrombocytopenia and dengue fever. Among the dengue fever patients, raised serum glutamic oxalo-acidic transaminase (SGOT) was the most well-known finding seen in 31.3% of patients while raised antacid phosphatase was seen in generally (32.0%) of the malaria patients. A sum of 29.6% of typhoid patients had raised SGPT.

Table 6: Treatment of Acute Undifferentiated fever in children

| Final aetiology          | No. of patients | Percentage |
|--------------------------|-----------------|------------|
| Ceftriaxone              | 98              | 33.7       |
| Chloroquine              | 74              | 25.5       |
| Doxycycline only         | 53              | 18.2       |
| Ceftriaxone or Azithromycin | 24        | 8.2        |
| Doxycycline or Azithromycin | 93       | 32.0       |

In Table 6, treatment-Enteric fever was treated with Ceftriaxone. Chloroquine was utilized for treatment of Malaria. Dengue was dealt with symptomatically and with liquids as per Dengue convention. On the off chance that fever continued even following 6 days of anti-microbials, at that point Azithromycin was added. UTI was treated with Ceftriaxone or Amikacin. In the undiscovered fever class, gotten experimental antibiotics.

5. Discussion

Acute Undifferentiated fever (AUF) is characterized as estimated temperature ≥ 38 °C and history of febrile disease of 2–14 days span, with no confined reason as decided by the treating doctor. They can be related with stomach ache, looseness of the bowels, haematochezia, nausea or vomiting, rhinorrhea, SOB, visual agony, altered sensorium, headache, neck stiffness, rash, joint pain, muscle pain, petechiae, ecchymosis, nose or gum bleeding and jaundice. AUF is not the same as pyrexia of obscure source fever of at any rate 3 weeks with no recognized reason even after examination.

Because of enhancements of lab offices and imaging the rate and etiological profile of fever have radically changed. Appropriate history taking and methodical assessment stays the highest quality level for fever sidestepping determination. Uncommonly for newborn children under one month old enough who are in danger for genuine and quickly reformist bacterial and viral diseases reasonable convention based examination and pre-emptive treatments are required. A syndromic way to deal with tropical contaminations can help in showing up at an etiology, plan examination board and pick early objective empiric treatment.

Tropical fever can be extensively named 1) Undifferentiated fever (Malaria (P. falciparum), scrub typhus, leptospirosis, typhoid, dengue); 2) Fever with rash/thrombocytopenia (Dengue, rickettsial diseases, meningococcal contamination, malaria (falciparum), leptospirosis, measles, rubella); 3) Fever with ARDS (Scrub typhus, falciparum malaria, flu - H1N1, leptospirosis, hantavirus, melodises, Legionella spp., Streptococcus pneumoniae); 4) Febrile encephalopathy (Herpes simplex infection, Japanese B, S. pneumoniae, Neisseria meningitides, Haemophilus flu, enteroviruses, scrub typhus, cerebral malaria and typhoid encephalopathy); 5) Fever with multi-organ brokenness (falciparum malaria, leptospirosis, scrub typhus, dengue, hepatitis A or E, Hanta virus infection).

In the present study, male children (63.3%) were more affected than female (36.6%). The most common age group affected in our study was between 3-5 years of age, reflecting active people are affected more with these illnesses which were also supported by literature. The predominance in males may be due to increased chances of exposure to mosquitoes and contaminated water due to their nature of work. Similar observation was made by other study conducted in northern India.

In Table 6, treatment-Enteric fever was treated with Ceftriaxone. Chloroquine was utilized for treatment of Malaria. Dengue was dealt with symptomatically and with liquids as per Dengue convention. On the off chance that fever continued even following 6 days of anti-microbials, at that point Azithromycin was added. UTI was treated with Ceftriaxone or Amikacin. In the undiscovered fever class, gotten experimental antibiotics.
falciparum. For dengue and chikungunya infection contaminations ELISA with explicit IgM antibodies should be finished. Enteric fever ought to be precluded by compound immunoassay to discover IgM and IgG antibodies. Widal test ought to incorporate agglutigating antibodies against O and H antigens of S. typhi and H antigens of S. paratyphi A.\textsuperscript{10–12}

In our investigation, pyrexia and headache pain were the two main symptoms with which youngsters with AUF introduced, like that announced by Prabha S.\textsuperscript{13} In their investigation, vomiting & cough were dominating in a specific order. Stomach pain and conjunctival suffusion investigation, vomiting & cough were dominating in a past report, normal clinical introductions and gastrointestinal symptoms, for example, stomach ache and diarrhoea. In a past report, normal clinical introductions involved fever, conjunctival congestion, and myalgia (81.9%).\textsuperscript{20} Derangement of liver enzymes is regularly seen in AFI. In dengue fever, aspartate aminotransferase has been found to expand all the more rapidly and will in general top at a more significant level. Lab finding of leukopenia and thrombocytopenia was fundamentally connected with Dengue like that revealed by Kundavaram AP.\textsuperscript{21}

An investigation directed by Singh et al from the district of Uttarakhand shows that dengue, malaria and Typhoid are the most widely recognized aetiological specialist of acute febrile illness.\textsuperscript{22} In nations like Thailand, Malaysia and Nepal - dengue fever, malaria, scrub typhus, leptospirosis and enteric have been distinguished as basic causes of intense undifferentiated fever.\textsuperscript{23} Chrispal et al had a perception in their investigation in south India on AFI where most patient had Dengue, Malaria, Leptospirosis and typhoid though concentrate by Neelu sree et al had announced Dengue, Malaria, Scrub typhus and leptospirosis in their examination.\textsuperscript{24,25}

Treatment of AUF needs clinical attentiveness of etiology. Dominant part is treated with observational antimicrobials. Chloroquine might be begun for suspected malaria, Ceftriaxone for Enteric fever. Dengue needs suggestive administration with liquids. Ceftriaxone or Amikacin might be begun for suspected UTI.

The etiology of AUFI stays difficult endeavors much of the time. Vector control measures, drinking water supply and disinfection ought to be improved to forestall vector borne and water borne sicknesses. District explicit epidemiological data set of reasons for AUFI should be made. Level-headed, normalized convention based appraisal and treatment of kids with intense undifferentiated fever can diminish undesirable examinations and antimicrobial use.

6. Limitations in our study

There are sure restrictions in our examination, for example, restricted demonstrative offices. Serology for Leptospirosis, Brucella, Chikungunya and other viral examinations would have expanded the particular analysis that might have been made. Our investigation was restricted as far as test size for singular analysis. The investigation with bigger example size would help in assessing the job of these boundaries in a superior manner.

7. Conclusion

Typhoid, Malaria, Dengue were the main significant reasons for acute undifferentiated fever in our investigation. District explicit mindfulness about aetiologies of acute undifferentiated fever would help in convenient recognition of such cases and subsequently better administration decreasing morbidity and mortality over the long run. The discoveries in our investigation underlines the significance of inferring symptomatic tests in a clinical context along with side effects, clinical discoveries and research center tests.
8. Conflicts of Interest
All contributing authors declare no conflicts of interest.

9. Source of Funding
None.

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Author biography
Ramesh Dasari, Associate Professor
Kadukuntla Swapna Reddy, Assistant Professor
Alekhya Nimmagadda, Intern
Sivani Saraswathi Kuruvada, Intern
Nuguri Sneha, Post Graduate
S Srikrishna, Professor and HOD