Original Research Article

Study of aetiology and clinical spectrum of patients with acute undifferentiated fever, in a tertiary care setting: a descriptive cross-sectional study

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ABSTRACT

Background: Acute undifferentiated fever illness (AUFI) is a common cause of morbidity and mortality in developing countries, owing to its non-specific features. The aim of the study was to delineate the causes and clinical parameters associated with AUFI.
Methods: A cross-sectional study was done among 156 patients of AUFI, admitted in the Department of Medicine, Indira Gandhi Medical College, Shimla, Himachal Pradesh, India, from November 2018 to October 2019.
Results: The mean age of the study participants was 37.37±14.2 years. The study participants admitted for acute undifferentiated febrile illness had fever with mean duration of 8.38±3.7 days before hospitalization. The most common aetiology of AUFI was found to be enteric fever (44%), followed by scrub typhus (35%). The majority of the cases presented from the month of September to December.
Conclusions: The aetiology and clinical spectrum of AUFI is wide and variable. To outline a proper algorithm to contain it, meticulous analysis of the hospital data at each level is necessary.

Keywords: Acute undifferentiated fever illness, Clinical spectrum, Hospital based, North India

INTRODUCTION

The term Acute undifferentiated fever illness (AUFI) is used to denote fevers that usually do not extend beyond a fortnight, and lack localizable or organ-specific clinical features. Acute undifferentiated fever (AUF), also known as 'acute febrile illness', 'short febrile illness', or 'acute fever' lacks an international consensus definition.[1] It typically includes fever of 14 days or less in duration without any localized source of infection.[2] AUFI contributes substantially towards the morbidity and mortality among children and adults worldwide.[3,4] It is a common cause of patients seeking healthcare in India and posing diagnostic and therapeutic challenge, especially between June and September. In AUF, symptoms are unspecific and initial management is syndromic approach and execution of rapid diagnostic test and if accurate diagnostic methods are not available, empirical treatment needs to be instituted in order to avoid deaths and specially if patient presents with severe sepsis.[2,5-8]

To improve the management of AUFI cases in resource-poor settings in tropical and subtropical countries, it is essential to understand the aetiologies associated with it. In areas with meagre availability of laboratory diagnosis, the local epidemiology of AUFI and validated clinical predictors would guide for the presumptive diagnosis and therapeutic interventions. Such data is also crucial for developing appropriate diagnostic tests and guidelines, and recommending proper public health interventions.[9] In resource limited settings fever may be treated empirically or self-treated due to lack of access to diagnostic tests.[10]

So, knowledge regarding local prevalence of infections is imperative in order to ameliorate the clinical work up and treatment. Meticulous analysis of institutional data to delineate spectrum and outcome of locally prevalent aetiologies of acute undifferentiated fever is utmost important for the prioritization of the differential diagnoses of a clinical syndrome of AUFI. Hence, the study was planned to investigate the aetiology and outcome of AUF in sub Himalayan region and to outline the possible algorithm and guidelines for the containment of AUF.

Aim

The aim of the study was to study the aetiology and clinical profile of adult patients with AUFI.

METHODS

The study design was hospital based cross-sectional descriptive study. The study was conducted in the department of medicine at Indira Gandhi Medical College Shimla, admitted from a period of November 2018 to October 2019.

Study population

The study population was diagnosed patients of AUFI.

Study methodology

After careful screening of patient's data recorded in the admission files, the demographic profile, clinical presentation, complications, investigations, diagnosis and the final outcome of every defined case was entered in the pre-approved proforma.

Inclusion criteria

All patients above 18 years of age, who gave consent for the study were included.

Exclusion criteria

Patient with immunodeficiency state (congenital or acquired); on immune-suppressants therapy (oral corticosteroids, combination chemotherapy); and with autoimmune disorders, malignancies or organ transplants were excluded.

Operational definition

Acute undifferentiated fever (AUF) is defined as measured temperature ≥100°F (38°C) and history of febrile illness of 2-14 days duration, with no localized cause as judged by the treating physician.[11]

Statistical analysis

The data was collected, cleaned and entered into Microsoft excel spread sheet and transferred to Epi info version 7.2.1.0 software. The categorical variables were expressed in terms of frequencies, proportions and percentages with 95% confidence intervals. The continuous variables expressed as means±standard deviation.

RESULTS

Among 156 study participants, 58% of males and 42% females, and most of them (78%) belonged to rural area. The mean age of the study participants was 37.37±14.2 years, and range from 19-70 years. The study participants admitted for acute undifferentiated febrile illness had fever with mean duration of 8.38±3.7 days before hospitalization (range 1-21 days). The mean duration of stay in the hospital was 5.30±3.2 days (range from 2-15 days). The hypertension was the most common associated comorbidity found, followed by diabetes and CVD (Table 1).

Nearly 40% of individuals had Respiratory rate (RR) more than 22 per minute, 44% had Systolic blood pressure (SBP) of less than 100 mmHg. The oxygen saturation (on pulse oximetry) was less than 90 among 64% and 62% had heart rate of more than 90 beats per minute. The most common aetiology of AUFI was enteric fever (44%) followed by scrub typhus (35%), dengue and malaria. However other than this the cases of leptospirosis were also found among 6% of the study individuals in our study (Table 2).

The majority of cases of dengue were positive in the month of July, that of Malaria in the month of August. While cases of enteric fever presented throughout the year, and scrub typhus cases were prevalent mostly from September to December. The clinical and laboratory parameters of the study participants, who presented with acute undifferentiated illness, are described in Table 3 and 4.

Table 1: Description of variables according to associated comorbidity (N=156).

Co-morbidity	N	%
COPD	4	2.6
Diabetes	38	24.3
Hypertension	50	32.1
CKD	8	5.1
CVD	22	14.1
None	106	67.9

Table 2: Description of Aetiologies of AUFI (N=156).

Aetiology	N	%
Dengue	15	10
Malaria	8	5
Enteric fever	69	44
Scrub typhus	54	35
Others	10	6

Table 3: Description of clinical parameters associated with AUFI (N=156).

Clinical parameters	Dengue (N=15)		Malaria (N=8)		Enteric fever (N=69)		Scrub typhus (N=54)	
	N	%	N	%	N	%	N	%
Rash	12	80	0		0		0	
Petechiae	9	60	0		0		0	
Arthralgia	4	27	3	38	13	19	28	52
Myalgia	7	47	7	88	26	38	29	54
Nausea/vomitting	0		4	50	15	22	12	22
Retrobulbar pain	10	67	2	25	4	6	14	26
Icterus	10	67	4	50	0		0	
Cyanosis	0		0		0		0	
Cough	0		3	38	4	6	4	7
Dyspnoea	6	40	4	50	3	4	8	15
Hemoptysis	0		0		0		0	
Crepitus	0		0		0		0	
Ronchi	0		0		0		0	
Pleural ffusion	0		0		0		0	
Pedal Eedema	0		0		0		0	
JVP	0		0		2	3	0	
Headache	12	80	4	50	15	22	20	37
Seizures	0		0		0		0	
Neck stiffness	0		0		0		1	2
Cranial nerve palsies	0		0		0		0	
Lymphadenopathy	4	27	0		2	3	10	19
Hepatomegaly	10	67	2	25	24	35	13	24
Splenomegaly	10	67	4	50	22	32	5	9
	14	93	5	63	32	46	7	13
Loose stools	8	53	3	38	34	49	5	9
Eschar	0		0		0		27	50

Table 4: Description of laboratory and serological parameters associated with AUFI (N=156).

Clinical parameters	Dengue (N=15)		Malaria (N=8)		Enteric fever (N=69)		Scrub typhus (N=54)	
	N	%	N	%	N	%	N	%
Anaemia	10	67	2	25	18	26	16	30
Leucocytosis	0		6	75	0		26	48
Leucopenia	10	67	0		22	32	0	
Thrombocytopenia	4	27	1	13	13	19	25	46
HCT increase >20%	5	33	4	50	24	35	14	26
Serum creatinine (mg%) >1.5	4	27	1	13	10	14	14	26
Serum total bilirubin (mg%) >1.5	10	67	0		15	22	12	22
Elevated serum alanine aminotransferase	8	53	2	25	18	26	20	37
Elevated serum aspartate aminotransferase	4	27	3	38	20	29	18	33

Continued.

Clinical parameters	Dengue (N=15)		Malaria (N=8)		Enteric fever (N=69)		Scrub typhus (N=54)	
	N	%	N	%	N	%	N	%
Deranged serum albumin	3	20	1	13	5	7	14	26
Azotemia	3	20	0		8	12	18	33
Abnormal peripheral smear	4	27	0		10	14	7	13
Abnormal urine examination	0		0		9	13	2	4
IgM scrub typhus	0		0		0		46	85
IgM typhoid	0		0		54	78	0	
IgM dengue	15	100	0		0	3	0	

DISCUSSION

In our study we found that majority of the patients, admitted for AUFI were males as compared to females. This was in concordance with the study done by Reller et al and Raina et al.[12,13]

The majority of the study participants were from rural background. This is due to the fact that nearly 80% of the population resides in the rural areas of Himachal Pradesh. This study finding is in line with the multicentric study done in South in India by Andrews et al.[14] Study conducted by Murdoch et al also showed similar findings in their study conducted in Nepal.[15] The mean age of the study participants in a study was found to be nearly 38 years ranging from 19 to 70 years. This is possibly due to the fact that the majority of the population of this age group is working in the fields where they may contract the diseases such as dengue, malaria and scrub typhus. However, the study conducted by Kumar et al found the mean age of around 26 years. Ahmad et al, found the mean age of the participants to be 40 years which is in accordance with our study.[16,17]

The mean duration of stay in the hospital in our study was around 5 days where as the mean duration of fever before hospitalization was found to be around 9 days in our study participants. This longer duration of fever before the hospitalization could be due to the fact that most of the population of the hilly state of Himachal Pradesh does not have access to the public transportation facilities during the night hours. In winters it becomes very difficult for the people to reach medical college from the far-flung areas as the hills are covered with snow most of the times. This study is not in accordance with the study conducted by Andrews et al.[14]

The majority of the patients were suffering from enteric fever followed by scrub typhus, malaria, dengue and leptospirosis. This was in concordance with the study conducted by Moreira et al, Laras et al, where the most common etiology of AUFI was found to be enteric fever followed by scrub typhus.[18,19]

The most common presentation among all the etiologies of undifferentiated febrile illness was found to be headache, while lymphadenopathy was found in all diseases except malaria. All the study participants had anemia, raised hematocrit, deranged renal function tests and liver function tests. Majority of the patients of scrub typhus had abnormal chest X-ray findings while half of them had abnormal ultrasonographic findings in abdomen. The study conducted by Costa et al and Kamath et al also showed similar presentations as found in our study.[20,21]

Limitations

The sample size was not large enough due to the shortage of time to conduct this study. Hospital based study cannot be used to assess the prevalence of the aetiologies of AUFI. Further analytical studies are needed to assess for the causes of these diseases and prognostic factors thereof.

CONCLUSION

The most common aetiology of AUFI was found to be enteric fever (44%) followed by Scrub typhus (35%), dengue (10%) and malaria (5%). The aetiology and clinical spectrum of AUFI is wide and variable. To outline a proper algorithm to contain it, meticulous analysis of the hospital data at each level is necessary. A devoir is needed to strengthen our health system both in terms of manpower and diagnostic facilities, so that timely appropriate management is done and the morbidity and mortality associated with AUFI is curtailed. Focus on IEC activities need to be stressed upon so that these diseases can be prevented and the complications do not arise.

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