Section: Community Medicine

Original Research Article

ACUTE FEVER COMMUNITY DIAGNOSIS IN A RURAL AREA OF TELANGANA, INDIA: COMMUNITY BASED CROSS-SECTIONAL STUDY

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Abstract

Background: Globally, acute febrile illness (AFI) is a common cause of hospital admission and its associated infectious causes such as respiratory tract infections, urinary tract infections, and intra-abdominal infections contribute to substantial morbidity and mortality. Acute fever, is one of the most common presenting complaints to primary care physicians in primary care in India. **Materials and Methods:** This was a community-based cross-sectional study conducted among 2627 individuals belonging to 1200 households of the Cherlapally area in Telangana state. The pre-designed questionnaire was used to collect relevant data on acute fever cases affected from the past month under RHTC field practice area. Socio-demographic data such as age, sex, education and socio-economic status were collected. Collected data was represented in percentages and proportions, and a p-value of less than 0.05 was considered statistically significant. **Results:** The prevalence of acute fever in the rural field practice area was 8.6%. In this study males were 44.1% and females were 55.9%. The majority of the study population belongs to the age group of 46 to 65 years (38.3%) and belongs to the lower class of socioeconomic status (29.1%). Fever with cough and cold in the study population is significantly associated with a lower age group ($p<0.0001$) and lower socio-economic status ($p<0.002$). In our study, individuals diagnosed with malaria, typhoid, and dengue (NS1) were 4%, 2.2%, and 2.2% respectively. **Conclusion:** Malaria was the most common cause of fever in this study. Utilizing the services of community health workers and health education about fever prevention and control and warning indicators can lessen the need for hospitalization. This research offers a newer approach to the epidemiological assessment of febrile illness in rural India.

INTRODUCTION

Acute fever, an elevation in core body temperature above the daily range (98.6ºF), is one of the most common presenting complaints to physicians in primary care and outpatient departments in India.[1–3] It has a wide spectrum of differential diagnoses from infectious to non-infectious causes. Malaria and dengue are the most prevalent febrile illness-associated forms of fever in India.[4] India is estimated to contribute to 34% of the total global burden of dengue.[5] Acute fevers caused by localized infections are categorized as Acute Febrile Illness (AFI) with system-specific signs and as Acute Undifferentiated Febrile Illness (AUFI) without organ or system-specific signs at their onset.[6]

Acute fever or acute febrile illness (AFI) can also arise due to localized infections, such as respiratory tract infections (RTIs), urinary tract infections (UTIs), intra-abdominal infections (IAIs), or skin and soft tissue infections (SSTIs).Acute undifferentiated febrile illnesses (AUFI) are characterized by fever (>38.3°C or 101.0°F) for greater than 2 days and lasting up to 14 days without organ-specific symptoms at the onset.[7,8] The severity of AUFIs ranges from mild or self-limiting to life-threatening illness. Some of the common causes of AUFIs include malaria, dengue, enteric fever, leptospirosis,

and scrub typhus, which continue to contribute significantly to the febrile disease burden in India.[8]

The diagnosis of acute fever is not always definitive based on clinical presentation alone, and correct diagnosis is reached only with definite diagnostic tests.[3,8] The nonspecific and overlapping clinical symptoms along with the non-availability of appropriate diagnostic modalities present a challenge to the treating physicians and can make timely treatment difficult.[2,9] Acute febrile illness is a common cause of hospital admission, and although it is not recognized as a disease state by the World Health Organization (WHO), its associated infectious causes contribute to substantial morbidity and death among children worldwide.[10]

Studies among adults with febrile illness who required hospital admission documented case fatality ratios that ranged from 5% to 24%.[11,12] In low- and middle-income countries (LMICs), where limited resources hinder diagnostic capacity, clinical management is infrequently supported by knowledge of the predominant local and regional etiologic pathogens.[13] In southeast Asia, where the predominant pathogens have been identified as dengue (5.4%–43.1%).[14,15], influenza (1.0%–38.8%).[16,17], chikungunya (1.2%–28.4%).[18,19], typhoid (1.8%–23%).[14,20], scrub typhus (in 1%–19.3% of febrile cases).[21,22], Japanese encephalitis virus (3.4%–5.8%).[14,16] and Burkholderia pseudomallei (0.2%–1.5%).[16,21].

In India community studies on fever etiology and community, diagnosis is fewer, especially in a rural area, the present study was undertaken as in Cherlapally, Telangana state to estimate the prevalence of acute fever cases in rural field practice area, to describe the clinical presentation and etiologic diagnosis of AFI in rural field practice area and to determine the knowledge, attitude and practices in relation to acute febrile illnesses.

MATERIALS AND METHODS

A community-based cross-sectional study was conducted in the rural field practice area of the Department of Community Medicine, Kamineni Institute of Medical Sciences, Narketpally, Telangana, India. Cherlapally consists of four wards, out of which one ward has been randomly selected and surveyed. The study was conducted over a period of three months from October to December 2022. It covers one ward with an estimated population of 2627 in 1200 households. House to house survey was done with these 1200 households. All individuals who were living in the study area with acute fever were included. Individuals who were not given consent and severely ill persons were excluded from this study.

A predesigned pretested survey questionnaire was used to collect the relevant data of acute fever cases affected from the past month under the RHTC field practice area. Socio-demographic data such as age, sex, education, and socio-economic status (SES) were collected. Updated BG Prasad's classification for the year 2022 was used to categorize the SES of the study participants. The information regarding fever symptoms, knowledge, attitude, and practice of tepid sponging during fever among study population were noted. The study was started after obtaining IEC clearance from the institute. After explaining the purpose and importance of the study informed consent was obtained from the participants or legal guardians before administering the study questionnaire and they were assured of confidentiality throughout the study.

Collected data were entered in a Microsoft Excel sheet and analyzed by using the software IBM SPSS (statistical package for social sciences) version 26. The results were represented in the form of percentages and proportions. The chi-square test was used to test for association between categorical variables and a p-value of less than 0.05 was considered as statistically significant.

RESULTS

A total of 227 acute fever cases were identified in this study. The prevalence of acute fever in the rural field practice area was 8.6% (227/2627). The majority of the study population were females (55.9%) and the remaining were males (44.1%). Most of the study population belongs to the age group of 46 to 65 years age group (38.3%) followed by 36 to 45 years (23.8%). The majority of the study population were having preschool education (29.1%) followed by upper primary (20.3%); graduate (18.1%); primary (16.7%) and intermediate (15.9%). Most of the study participants belonged to the lower class of socioeconomic status (29.1%) followed by lower middle (24.6%); middle class (22.9%); upper class (13.7%) and upper middle class (9.7%). These were shown in table 1.

Table 1: Socio-demographic characteristics of the study population

Variable		Frequency	Percentage
Age (in years)	0-5	11	4.8
	15-Jun	8	3.5
	16-25	38	16.7
	26-35	21	9.3
	36-45	54	23.8
	46-65	87	38.3
	> 65	8	3.5
Sex	Male	100	44.1
	Female	127	55.9

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Education	Pre-school	66	29.1
	Primary	38	16.7
	Upper primary	46	20.3
	Intermediate	36	15.9
	Graduate	41	18.1
SES	Upper Class	31	13.7
	Upper Middle Class	22	9.7
	Middle Class	52	22.9
	Lower Middle Class	56	24.6
	Lower Class	66	29.1

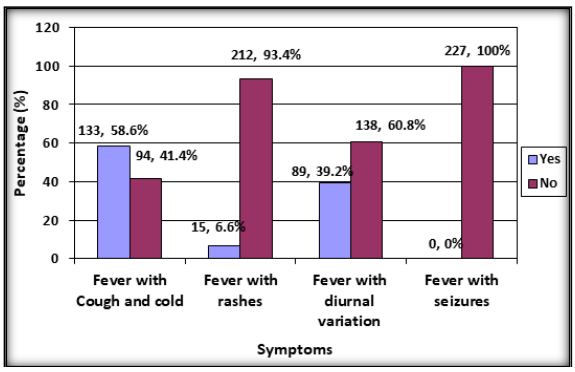

Figure 1: Fever and its associated symptoms in the study Population

Figure 1 shows that among the study population, various symptoms associated with fever include cough and cold (58.6%), rashes (6.6%), and diurnal variation with an evening rise in temperature (39.2%).

Table 2: Treatment-seeking behaviour among the study population

Variable	Frequency	Percentage
Home-based	128	56.4
Hospital-based	73	32.2
Rural medical practitioner	26	11.4
Total	227	100

Regarding the treatment-seeking behaviour among the study population, the majority (56.4%) preferred home-based treatment followed by hospital-based treatment (32.2%) and rural medical practitioner (11.4%). This was shown in table 2.

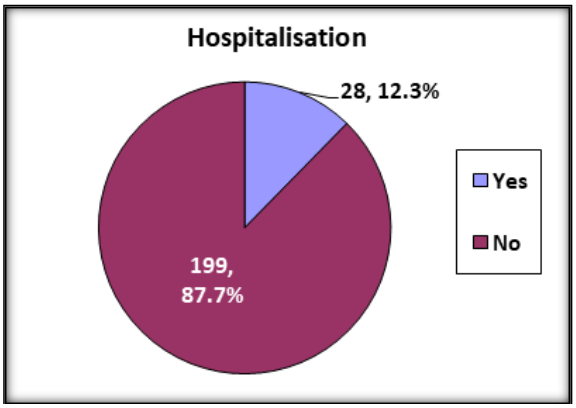

Figure 2: Hospitalisation status among the study population

Figure 2 shows that about 28 (12.3%) individuals with acute fever were hospitalized for treatment in this study.

Table 3: KAP of tepid sponging among the study population

Tepid sponging		Frequency	Percentage
Knowledge	Yes	144	63.4
	No	83	36.6
Attitude	Yes	95	41.9
	No	132	58.1
Practice	Yes	98	43.2
	No	129	56.8

Table 3 depicts that, knowledge of tepid sponging during fever was present in 63.4% of the study participants. The practice of tepid sponging was only 43.2% of the study population.

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Table 4: Association of fever with cough and cold in the study population

Variable		Fever with cough and cold		p-value
		Yes (%)	No (%)	
Age	0-5	11 (100)	0 (0)	
	15-Jun	8 (100)	0 (0)	
	16-25	38 (100)	0 (0)	< 0.0001 s
	26-35	11 (52.4)	10 (47.6)	
	36-45	20 (37)	34 (63)	
	46-65	37 (42.5)	50 (57.5)	
	>65	8 (100)	0 (0)	
Sex	Male	59 (59)	41 (41)	1.0 ns
	Female	74 (58.3)	53 (41.7)	
Education	Pre-school	17 (25.8)	49 (74.2)	
	Primary	29 (76.3)	9 (23.7)	< 0.0001 s
	Upper Primary	26 (56.5)	20 (43.5)	
	Intermediate	28 (77.8)	8 (22.2)	
	Graduate	33 (80.5)	8 (19.5)	
SES	Upper class	16 (51.6)	15 (48.4)	
	Upper middle class	5 (22.7)	17 (77.3)	0.002 s
	Middle class	30 (57.7)	22 (42.3)	
	Lower middle class	38 (67.9)	18 (32.1)	
	Lower class	45 (68.2)	21 (31.8)	

s - Significant, ns - not significant

Table 4 depicts that fever with cough and cold in the study population is highly associated with the lower age group and this is statistically significant (p<0.0001). Fever with cough and cold in the study population is highly associated with the lower socio-economic status and this is statistically significant (p<0.002). In our study, individuals diagnosed with malaria, typhoid, and dengue (NS1) were 4%, 2.2%, and 2.2% respectively.

DISCUSSION

In this study, about 227 acute fever cases were included from the rural field practice area. More than half of the study population were females (55.9%). Whereas in a study done by Bressan Cd S et al.[23] majority of their study participants were males (51%) and the remaining females (49%). The majority of the study participants were males in various studies done by Hercik C et al.[24] (66%); Morch K et al.[4] (57%) and Haanshuus CG et al.[25] (58%). Most of the study population in this study belongs to the age group of 46 to 65 years age group (38.3%) followed by 36 to 45 years (23.8%). Similarly, majority of the study population belongs to the age group of 19 to 40 years (52%) and 41 to 60 years (34%) in the study done by Bressan CdS et al.[23] Hercik C et al.[24] also depicted majority of their study participants belong to 15 years and above age group (67%). About 13% of patients were < 14 years old in a study done by Haanshuus CG et al.[25] The majority of the study population were having preschool education (29.1%), whereas in a study done by Hercik C et al.[24] 71% of patients were having primary school-level education or below. The majority of the study participants belongs to the lower class of socio-economic status (29.1%) followed by the lower middle (24.6%); middle class (22.9%); upper class (13.7%) and upper middle class (9.7%). Whereas in Hercik C et al.[24] study, Socio-economic Status also varied greatly among all enrolled participants, with the majority of patients (57%) falling within the two poorest quintiles.

Among the study population, various symptoms associated with fever includes cough and cold (58.6%), rashes (6.6%) and diurnal variation with evening rise of temperature (39.2%). In Hercik C et al.[24] study, the most common presenting complaints, other than fever, were headache (80%), cough (32%) and abdominal pain (19%). Morch K et al.[4] study revealed malaria positivity was found in 17%, dengue in 16%, scrub typhus in 10%, bacteremia in 8%, leptospirosis in 7%, and chikungunya in 6% of their study population. Morch K et al.[4] study also depicted the highest prevalence of malaria was found in West, North, and Central India with the highest in Ratnagiri (34%); the highest prevalence of dengue was found in South India and West India with the highest in Anantapur (34%) and a high prevalence of chikungunya (18%) was also found in Anantapur of Andhra Pradesh state.

Regarding the treatment-seeking behaviour among the study population, the majority (56.4%) were preferring home-based treatment followed by hospital-based treatment (32.2%) and rural medical practitioner (11.4%). About 28 (12.3%) individuals with acute fever were hospitalized for treatment in this study. Contrary to these results, Hercik C et al.[24] study showed 46% of all enrolled participants were admitted for in-patient care and treatment.In our study, individuals diagnosed with malaria, typhoid, and dengue (NS1) were 4%, 2.2%, and 2.2% respectively. Haanshuus CG et al.[25] conducted study among hospitalized patients with acute undifferentiated fever in six states of India revealed malaria prevalence as high as 19% ranging from 6% (Oddanchatram,South India) to 35% (Ratnagiri, West India). In another study done by Mishra G.[26] and Joshi R et al.[27] from India among hospitalized fever

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patients reported a malaria prevalence of 10% and 12% respectively. Whereas in Hercik C et al.[24] study, the most common provisional diagnosis was malaria (39%), followed by undefined fever (19%), urinary tract infection (17%), and upper respiratory infection (16%). Unfortunately, due to the similar clinical presentation and optimal confirmatory tests being inaccessible and unaffordable.[28] the aetiology of AUF frequently remains uncertain.[4,29] In order to accurately diagnose and treat patients, a step-by-step approach that takes into account the diagnostic opportunities in the local region, clinical symptoms of various acute fever types, and patient characteristics, in particular, can be helpful.[6]

Knowledge of tepid sponging during fever was present in 63.4% of the study participants with practice of tepid sponging at only 43.2%. This shows the knowledge and practice gap among the study participants. Fever is associated with cough and cold in the study population with the highest in the lower age group and this is statistically significant ($p<0.0001$). Whereas, significant results were obtained among the 15+ years age group in a study done by Hercik C et al.[24] Fever is associated with cough and cold in the study population with the highest in the lower socio-economic status and this is statistically significant ($p<0.002$). Similar results were also obtained in a study done by Hercik C et al.[24]

Our study has some limitations of being cross-sectional and only lasting a few months. It can be extended for an additional two to three years in order to carry out extensive research on the seasonal fluctuations in disease and illness, establish research and syndromic algorithms, and enhance the diagnostic precision of patients with AFIs.

CONCLUSION

The prevalence of acute fever in the rural field practice area was 8.6%. Malaria was the most common cause of fever in this study. There was an association between lower age groups, lower socioeconomic levels, and a higher risk of developing acute febrile diseases. Utilizing the services of community health workers and health education about fever prevention and control and warning indicators can lessen the need for hospitalization. With the help of the evidence-based approach in stepwise treatment strategy, primary healthcare professionals can better manage fever by using the appropriate diagnostic techniques and starting early empiric treatment based on clinical symptoms.

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