

ORIGINAL ARTICLE

Clinical profile of acute undifferentiated febrile illness in patients admitted to a teaching hospital in Kerala

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Abstract

In the last 5 years, Kerala witnessed fever epidemics during monsoon season resulting in severe physical, mental and financial strain to both individuals and society.

Objective: To describe the pattern of AEFI in 2007 and 2012 in central Kerala and to see whether any change in the clinical profile has occurred.

Materials and methods: AEFI cases admitted in the medicine wards of Government medical college Thrissur were studied in the months of June and July in 2007 retrospectively and in 2012 prospectively.

Preset diagnostic criteria were used to classify the cases into the common etiologies involved. The demographic, clinical and laboratory parameters were analyzed.

Results: There were 273 cases of AEFI in the months of June and July 2007. Out of the 273 patients, 113 (41.4%) were diagnosed to have leptospirosis, 41 (15%) to have dengue fever and 34 (12.5%) to have Chikungunya. Eighty five (31%) cases could not be classified. In June and July 2012 a total of 96 patients with AEFI were enrolled. Major etiologies identified were leptospirosis 23 (23.96%), dengue 12 (12.50%) and miscellaneous 61 (63.54 %). In 2007 and 2012 mortality in cases of leptospirosis was 24 (21.2%) and 6 (26.09%) respectively. No patients with either dengue fever or Chikungunya died in both epidemics.

Conclusion: Leptospirosis constituted a significant proportion of cases in both series. Case fatality was less in 2012 but the percent of patients died due to leptospirosis among patients admitted to the hospital remained almost the same. In a large number of patients with AEFI, the exact cause could not be identified.

Introduction

Every year in Kerala, a large number of patients suffer from acute fever, especially during the rainy season.¹ Acute fever cases in which no focus of infection can be pointed out by history, physical examination or routine investigations are common and are

referred as Acute undifferentiated fever (AEFI).²

The common presentations are fever of less than two weeks duration and non-specific symptoms like malaise, myalgia, headache and loss of appetite.³ In the western world AEFI is mainly due to viral illness, but in underdeveloped countries including India , it can be due to potentially treatable life threatening illnesses such as malaria, leptospirosis, Hanta virus infection and Japanese encephalitis.⁴ Since many diseases can have similar presentation, patients are advised to undergo various investigations which delay the treatment and increase the cost. In spite of the repeated epidemics in Kerala, published data on the experiences is scanty. This hinders the development of organizing preventive plans effectively.

Aim of the study

To compare the clinical features of AEFI in 2007 and 2012 in the rainy seasons in Kerala

Materials and methods

Patients admitted to the Government Medical College hospital, Thrissur formed the subjects of the study. The collegiate hospital served three adjoining districts of Kerala- Thrissur, Malappuram and Palakkad.

The inclusion criteria of AEFI were temperature over 38.3°C, duration of fever less than 14 days, and non detection of specific single organ involvement by history, physical examination and routine investigations.

2007 epidemic was studied by a retrospective analysis of the case sheets of all the patients who were admitted for AEFI during the months of June and July in the year 2007. Using a pre-designed proforma, data was extracted from the case sheets. The cases were grouped into leptospirosis, dengue fever, Chikungunya and miscellaneous based on the clinical features.

2012 epidemic was studied prospectively. All adult patients, (13 years old and above) admitted to the hospital with acute febrile illness in June and July 2012 were considered. For all the patients, a detailed clinical examination was done. The routine laboratory tests such as complete blood count, urine analysis, urea, creatinine, glucose and liver function tests were done. Additional investigations including peripheral smear, blood culture, chest X-ray, Widal, rapid card test for malarial antigen, serology for leptospirosis and dengue were done as per decision of the treating physician.

Diagnosis was made using Modified Faine's criteria for leptospirosis, WHO 2009 criteria

for dengue fever ⁵ and European Centre for Disease Control (ECDC) ⁶ for Chikungunya.

Data was analyzed using Epi-Info 7. Demographic data and clinical characteristic were summarized with counts (percentages) for categorical variables, and mean with standard deviation (SD) for normally distributed continuous variables. Categorical variables were compared using chi square test and p values < 0.05 were taken as significant.

Results

Between 1st June and 31st July in 2007 and 2012 there were 273 and 96 in-patients respectively with a diagnosis of AEFI. In 2007, 166 were males (61%) and 107 (39%) were females while in 2011, 85 (88.54%) were males and 11 (11.5%) females. Majority among both the study samples were in the middle age group (Table 1).

Table 1. The age distribution of AEFI patients in 2007 and 2012

Age	AEFI* in 2007		AEFI* in 2012	
	Number	%	Number	%
10 to 20	34	12.5	12	12.5
20 to 49	49	17.9	22	22.9

30		5		
30 to 40	66	24.	16	16.7
40 to 50	42	15.	21	21.9
50 to 60	41	14.	13	13.5
60 to 70	28	10.	9	9.4
> 70	13	5	3	3.1
Total	273	10	96	100
		0		

*AUFU-Acute undifferentiated fever

Among AUFU patients of 2007 epidemic, the commonest symptom was myalgia and joint pain, followed by calf muscle tenderness, oliguria, diarrhea, cough and dyspnea (Table 2).

Table 2. Clinical features of AUFU patients in 2007 and 2012 epidemics

Clinical features	AUFU* 2007		AUFU* 2012	
	Num ber	%	Num ber	%
Myalgia/joint pain	106	39%	49	52.1%
Diarrhoea	37	13.67%	24	25.5%
Cough/Dyspnea	27	9.9%	33	34.37%
Oliguria	46	16.67%	25	27.08%
Calf muscle tenderness	85	31.25%	21	21.87%
Total patients	273	100%	96	100%

*AUFU-Acute undifferentiated fever

The 2007 epidemic was constituted by leptospirosis, Dengue, Chikungunya and miscellaneous groups. The 2012 epidemic was constituted by leptospirosis, Dengue and miscellaneous only. There were no cases of Chikungunya among the in-patients in 2012 (Table 3).

Table 3. Etiological classification of AUFU in 2007 and 2012

Etiological diagnosis	AUFU* 2007		AUFU*2012	
	Num ber	%	Num ber	%
Leptospirosis	113	41.3%	23	23.96%
Dengue	41	15%	12	12.50%
Chikungunya	34	12.45%	0	0.00%
Unclassified/ Miscellaneous	85	31%	61	63.54%
Total	273	100%	96	100%

*AUFU-Acute undifferentiated fever

Using clinical and serological criteria, 113 patients in 2007 and 23 patients in 2012 were diagnosed to have leptospirosis. Forty one patients (15.5%) in 2007 and twelve (12.55%) in 2012 were above 60 years of age. Major symptoms in leptospirosis were conjunctival congestion, myalgia and jaundice. Incidence of dyspnoea, oliguria and jaundice were more in leptospirosis cases of 2012 (Table 4).

Table 4. Clinical features of Leptospirosis in 2007 and 2012 in Thrissur

	2007	n	113	2012	n	23
Myalgia	90	(80)		16		69.57%
Diarrhea	31	(25)		8		34.78%
Dyspnea	19	(17)		9		39.13%
Oliguria	35	(31)		10		43.48%
Jaundice	46	(41)		13		56.52%
Hemorrhage- multiple sites	16			1		4.35%
Conjunctival congestion	77	(68)		13		56.52%

Twenty four patients (8.8%) of AUFIs died in 2007 and 6 (6.4%) in 2012 and all were due to leptospirosis. The mean duration of fever before admission in AUFIs was 6.4 days and in the expired group it was 5.1 days.

Discussion

The purpose of this study was to identify and compare the various causes and clinical presentations of acute undifferentiated febrile illness in Kerala. The months of June and July were selected as in Kerala, fever cases peak during the monsoon period. Rainfall is a known important epidemiological risk factor for leptospirosis.¹

Majority of the patients were in the middle age group at risk for likely exposure to environmental pathogens. The age group between 20 to 50 years is the economically productive period during which they have high chance of having contact with contaminated environment. The predominance in males is likely to be due to more chance of exposure to organisms due to their nature of work. Our observation is consistent with the observations from Calicut⁷ and Chennai. Lower utilization of health care delivery facilities by females due to socio-cultural reasons could be another reason.

The number of admitted cases dropped in 2012 when compared to 2007. This could be due to the late arrival of scanty monsoon rains in 2012, which might have minimized the usual environmental pollution due to decaying waste materials dumped into water and dampened atmosphere. It could also be due to effect of preventive measures including upgradation of peripheral health care facilities which held back the patients from reaching the Medical College hospital.

There was not much difference in the clinical symptoms of acute febrile illness in both the epidemics. The common symptoms reported in both the epidemics were comparable.

Major causes of AEFI identified were leptospirosis, dengue and miscellaneous group.

In both 2007 and 2012, leptospirosis was one of the major contributors of AEFI in Kerala.

Major symptoms in patients with leptospirosis were conjunctival congestion, myalgia and jaundice. Incidence of dyspnoea, oliguria and jaundice were more in the 2012 epidemic. Recently, there has been a change in the pattern of leptospirosis with pulmonary syndrome as a major cause of mortality.⁸ Among the 23 patients with clinical leptospirosis in 2012, only one was female. Women engaged in house hold work is less likely to get exposed to contaminated water compared to men who work outside. Chikungunya cases were absent in 2012; the reason is not clear.

In both the epidemics, the miscellaneous group was an important contributor of acute febrile illness. The results are comparable with that of the Thai prospective study.¹ In the miscellaneous group of 2012, no definite cause was found in 63.54% (61) and was presumed to be of viral origin.

There was no death among patients with dengue fever and Chikungunya during the study period.

In both the epidemics mortality was due to leptospirosis only. Mortality rates of 5-15% are seen in severe leptospirosis.⁹ In 2007, twenty four patients (21.2%) and in 2012, six patients (26.09%) died. The mortality in leptospirosis cases is thus almost the same in both the epidemics. Findings of pulmonary syndrome was seen all the patients who died. Involvement of the lung and central nervous system are significant predictors of death.⁷ Pulmonary involvement was the strongest risk factor for mortality in Brazil also.¹⁰

The number and percentage of leptospirosis cases have shown a decrease from 2007 to 2012. The percentage of dengue significantly increased in 2012.

Serological tests for leptospirosis become positive only after the fifth day and the initial diagnosis is by clinical examination only. Once epidemic occurred, clinical and epidemiological features are depended for starting treatment. As treatment was priority, serological confirmations for diagnosis in many patients in the study were not awaited.

Further studies are needed to identify the causes of fever in the miscellaneous group. We have to be on the guard for emerging and reemerging infections such as scrub typhus and malaria.

Limitations

One component of our study was retrospective and other prospective. Serological confirmation of clinical diagnosis was not done in all the cases. Observations of in-patient data from a tertiary care centre may not be applicable to a community.

Conclusions

Limited resources and the great diversity of AUFI etiologies challenge diagnosis, treatment, and public health responses. As majority of the patients present with non-specific symptoms (e.g., low-grade fever, general malaise, headache, and muscle ache) without evidence of focal infection, treatment is often empirical. In both the epidemics, the diseases mainly affected the middle aged group among whom there was a male predominance. Respiratory symptoms such as cough and breathlessness were more in leptospirosis cases of 2012 epidemic. In both the epidemics mortality is confined to leptospirosis cases only.

Ethical issues / conflict of interest

No interventions were done as part of study. Patients were managed as per the guidelines followed by the treating physician. After informed consent, data was collected and approval of institutional review board was taken before the start of the study.

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