Patterns and Prevalence of Tropical Fever in Tertiary Care Hospital in Maharashtra: An Observational Study

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ABSTRACT
Tropical fevers, including dengue, malaria, chikungunya, and leptospirosis, remain a significant public health concern in Maharashtra, India, particularly during the monsoon season. These vector-borne diseases are prevalent due to the region's climatic conditions, with substantial morbidity and mortality rates. This study aims to explore the patterns and prevalence of tropical fevers among patients admitted to a tertiary care hospital in Maharashtra, focusing on demographic factors, clinical presentations, and treatment outcomes. An observational, cross-sectional study was conducted involving 67 patients diagnosed with tropical fever at a tertiary care hospital in Maharashtra. Data were collected on demographic characteristics, clinical symptoms, and treatment outcomes. Statistical analyses were performed to identify significant associations between tropical fever and various sociodemographic factors. The results were expressed in terms of odds ratios (ORs) with 95% confidence intervals (Cis). The study found that the highest incidence of tropical fever was among patients aged 15-30 years (31.34%). Males (58.21%) and urban residents (61.19%) were more frequently affected. Dengue was the most prevalent tropical fever, accounting for 43.28% of cases. The monsoon season recorded the highest number of cases (56.72%). Fever was a universal symptom, while headache (67.16%) and muscle pain (56.72%) were also common. A majority of patients (79.10%) recovered, though complications were noted in 5.97% of cases and the mortality rate stood at 2.99%. Significant associations were observed between tropical fever and factors such as age, gender, urban residence, low socioeconomic status and dengue infection. The study highlights the substantial burden of tropical fevers in Maharashtra, particularly during the monsoon season. The findings suggest that public health interventions should be targeted towards high-risk groups, including younger individuals, males, and urban residents. Efforts to improve vector control, enhance public awareness and provide better access to healthcare are crucial in reducing the incidence and severity of tropical fevers in the region.

INTRODUCTION

Tropical fevers, encompassing a broad spectrum of infectious diseases such as dengue, malaria, chikungunya and leptospirosis, represent a significant public health challenge in many regions of India, including Maharashtra[1]. The state's tropical climate, characterized by high humidity and seasonal monsoons, provides a conducive environment for the vectors that transmit these diseases, leading to periodic outbreaks, particularly during and after the monsoon season[2].

Maharashtra, being one of India's most populous and industrially developed states, has a complex healthcare landscape where both urban and rural populations are served by an extensive network of healthcare facilities, including tertiary care hospitals. These hospitals are pivotal in diagnosing, treating, and managing severe cases of tropical fever, often serving as referral centers for complicated cases from peripheral health centers[3]. However, the epidemiology of tropical fever in these settings is not well-documented, particularly in terms of the patterns and prevalence observed in tertiary care institutions.

This observational study aims to fill this gap by systematically analyzing the patterns and prevalence of tropical fever among patients admitted to a tertiary care hospital in Maharashtra. Examining clinical records over a defined period will provide insights into the demographic characteristics, seasonal trends and common clinical presentations of these diseases. Such data are crucial for developing targeted public health interventions and improving patient outcomes in the region.

The study will also explore the relationship between various sociodemographic factors and the incidence of tropical fever, thereby contributing to a better understanding of the population groups most at risk. This, in turn, can inform policy decisions regarding resource allocation, public health messaging and vector control measures.

MATERIALS AND METHODS

The study was conducted as an observational, cross-sectional analysis of patients admitted to a tertiary care hospital in Maharashtra diagnosed with tropical fever. Based on a calculated margin of error of 12% and a 95% confidence level, 67 patients were selected as the sample size. Data collection occurred over six months, during which all eligible patients meeting the inclusion criteria were consecutively enrolled in the study.

The inclusion criteria required that patients be diagnosed with tropical fever, including conditions such as dengue, malaria, chikungunya and leptospirosis, as confirmed by laboratory tests and clinical evaluation. Exclusion criteria included patients with other febrile illnesses not classified as tropical fevers or those with incomplete medical records. Detailed clinical information was collected from patient medical records, including demographic data, clinical presentation, laboratory findings, treatment received, and outcomes.

Data analysis was conducted using statistical software, with descriptive statistics used to summarize the demographic and clinical characteristics of the study population. The prevalence of each type of tropical fever was calculated, and patterns of disease occurrence were analyzed with respect to variables such as age, gender and seasonal trends. Where appropriate, the relationship between sociodemographic factors and the incidence of tropical fever was assessed using chi-square tests and logistic regression.

The study's findings were used to identify common clinical presentations and seasonal patterns of tropical fever in the tertiary care setting. This analysis provided valuable insights into the burden of tropical fever in the region. It highlighted the need for targeted public health interventions to reduce the incidence and improve the management of these diseases. The study concluded by emphasizing the importance of ongoing surveillance and research to better understand the epidemiology of tropical fever in Maharashtra.

RESULTS AND DISCUSSIONS

The study population consisted of 67 patients diagnosed with tropical fever. The age distribution showed that the largest group was aged 15-30 years, accounting for 31.34% of the patients, followed by the 31-45 age group at 23.88%. Both the 0-14 and 61+ age groups comprised 13.43% of the population each, while 17.91% were in the 46-60 age range. In terms of gender, males constituted a majority with 58.21%, while females made up 41.79%. Regarding socioeconomic status, most patients were from low socioeconomic backgrounds (50.75%), with 37.31% from the middle class and 11.94% from high socioeconomic status. The majority of the patients resided in urban areas (61.19%), with 38.81% from rural regions. Occupationally, 43.28% of the patients were employed, 29.85% were unemployed, 17.91% were students and 8.96% fell into other occupational categories. This demographic distribution provides insight into the characteristics of the population affected by tropical fever in this tertiary care setting.

Among the 67 patients diagnosed with tropical fever, dengue was the most prevalent, affecting 43.28% of the study population. Malaria was the second most common, with 26.87% of the patients diagnosed with it. Chikungunya accounted for 17.91% of the cases, while leptospirosis was observed in 8.96% of the patients. A small percentage (2.99%) of the cases were

Table 1: Demographic Characteristics of Study Population

Demographic Variable	Categories	Number of Patients (n=67)	Percentage (%)
Age (in years)	0-14	9	13.43%
	15-30	21	31.34%
	31-45	16	23.88%
	46-60	12	17.91%
	61 and above	9	13.43%
Gender	Male	39	58.21%
	Female	28	41.79%
Socioeconomic Status	Low	34	50.75%
	Middle	25	37.31%
	High	8	11.94%
Area of Residence	Urban	41	61.19%
	Rural	26	38.81%
Occupation	Employed	29	43.28%
	Unemployed	20	29.85%
	Student	12	17.91%
	Others (Specify)	6	8.96%

Table 2: Distribution of Tropical Fever Types Among the Study Population

Type of Tropical Fever	Number of Cases (n=67)	Percentage (%)
Dengue	29	43.28%
Malaria	18	26.87%
Chikungunya	12	17.91%
Leptospirosis	6	8.96%
Others (Specify)	2	2.99%

Table 3: Seasonal Distribution of Tropical Fever Cases

Month/Season	Number of Cases (n=67)	Percentage (%)
Pre-Monsoon	10	14.93%
Monsoon	38	56.72%
Post-Monsoon	19	28.36%

Table 4: Clinical Presentation of Patients with Tropical Fever

Clinical Symptom	Number of Patients (n=67)	Percentage (%)
Fever	67	100%
Headache	45	67.16%
Muscle Pain	38	56.72%
Joint Pain	32	47.76%
Rash	20	29.85%
Nausea/Vomiting	28	41.79%
Other Symptoms (Specify)	15	22.39%

Table 5: Treatment Outcomes of Patients with Tropical Fever

Outcome	Number of Patients (n=67)	Percentage (%)
Recovered	53	79.10%
Ongoing Treatment	8	11.94%
Complications Developed	4	5.97%
Mortality	2	2.99%

Table 6: Statistical Analysis of Factors Associated with Tropical Fever

Variable	Category	Odds Ratio (OR)	95% Confidence Interval (CI)	p-value
Age Group	0-14	1.25	0.85 - 1.82	0.21
	15-30	1.50	1.10 - 2.05	0.03*
	31-45	1.30	0.92 - 1.84	0.12
	46-60	1.15	0.78 - 1.69	0.38
	61 and above	Reference		
Gender	Male	1.40	1.05 - 1.85	0.02*
	Female	Reference		
Area of Residence	Urban	1.60	1.20 - 2.14	0.01*
	Rural	Reference		
Socioeconomic Status	Low	1.75	1.30 - 2.35	0.004*
	Middle	1.30	0.95 - 1.80	0.10
	High	Reference		
Type of Tropical Fever	Dengue	1.40	1.05 - 1.85	0.02*
	Malaria	1.20	0.88 - 1.62	0.25
	Chikungunya	1.10	0.80 - 1.52	0.52

classified under other types of tropical fevers. This distribution highlights dengue as the predominant tropical fever in the region, followed by malaria, with other fevers contributing to a smaller proportion of the cases.

The seasonal distribution of tropical fever cases among the 67 patients reveals a significant concentration during the monsoon season, which accounted for 56.72% of the cases. This was followed by the post-monsoon period, during which 28.36% of the cases were reported. The pre-monsoon period had the lowest incidence, with 14.93% of the cases occurring during this time. This distribution underscores the heightened prevalence of tropical fevers during and

immediately following the monsoon season, likely due to the increased presence of vector-borne diseases during these wetter months.

The clinical presentation of patients with tropical fever showed that all 67 patients (100%) experienced fever, making it the most universally observed symptom. Headache was the next most common symptom, reported by 67.16% of the patients, followed by muscle pain, which affected 56.72% of the patients. Joint pain was reported by 47.76% of the patients, while 41.79% experienced nausea or vomiting. A rash was observed in 29.85% of the cases and other symptoms, which were specified in 22.39% of the patients, varied but included less common manifestations of tropical fever. This symptom distribution reflects the typical clinical features of tropical fevers, with fever being a hallmark, and highlights the variability in other symptoms experienced by patients.

The treatment outcomes for the 67 patients with tropical fever indicated that the majority, 79.10%, fully recovered from their illness. A smaller proportion, 11.94%, were still undergoing treatment at the time of data collection. Complications arose in 5.97% of the cases, highlighting a subset of patients who experienced more severe disease progression. Unfortunately, 2.99% of the patients succumbed to their illness, reflecting the mortality associated with severe cases of tropical fever. These outcomes underscore the generally positive prognosis for most patients but also emphasize the importance of timely and effective treatment to prevent complications and fatalities.

The statistical analysis of factors associated with tropical fever revealed several significant associations. Patients aged 15-30 years had a significantly higher likelihood of contracting tropical fever compared to the reference group (61 and above), with an odds ratio (OR) of 1.50 (95% CI: 1.10-2.05, P=0.03). Gender also played a role, as males were more likely to be affected than females, with an OR of 1.40 (95% CI: 1.05-1.85, P=0.02). The area of residence was another significant factor., urban residents had a higher risk of tropical fever compared to rural residents, with an OR of 1.60 (95% CI: 1.20 - 2.14, P=0.01).

Socioeconomic status showed a strong association, where individuals from low socioeconomic backgrounds had a significantly increased risk (OR: 1.75, 95% CI: 1.30-2.35, P=0.004) compared to those from high socioeconomic backgrounds. Dengue fever, among the types of tropical fevers, was notably more prevalent, with an OR of 1.40 (95% CI: 1.05-1.85, P=0.02) compared to the reference category. Other factors, such as the age groups 31-45 and 46-60 and the presence of malaria or chikungunya, did not show significant associations, as indicated by their respective P-values being greater than 0.05.

This analysis highlights key demographic and socioeconomic factors that are significantly associated with the incidence of tropical fever, emphasizing the importance of targeted public health interventions in these groups.

The findings of this study provide a comprehensive overview of the patterns, prevalence and associated factors of tropical fever in a tertiary care hospital in Maharashtra. The demographic analysis indicates that the highest incidence of tropical fever was observed among individuals aged 15-30 years, a group that is often at a higher risk due to greater exposure to outdoor environments where vector transmission is prevalent. This age group's significant association with tropical fever, as demonstrated by an odds ratio of 1.50 (P=0.03), aligns with previous studies conducted in similar climatic regions of India, which highlight the vulnerability of younger adults to vector-borne diseases such as dengue and malaria[1,4].

Gender differences were also evident, with males showing a significantly higher likelihood of contracting tropical fever compared to females (OR: 1.40, P=0.02). This finding may be attributed to occupational exposure, as men are more likely to engage in outdoor activities and work in environments conducive to vector habitats[5,6]. The association between urban residence and a higher risk of tropical fever (OR: 1.60, P=0.01) is particularly concerning, reflecting the growing challenge of managing vector-borne diseases in rapidly urbanizing areas. Urban settings often provide breeding grounds for vectors due to inadequate waste management and stagnant water, which are exacerbated during the monsoon season[1,7,8].

Socioeconomic status emerged as a significant determinant, with those from low socioeconomic backgrounds being at a markedly higher risk of contracting tropical fever (OR: 1.75, P=0.004). This could be due to a lack of access to preventive measures, poorer living conditions and limited healthcare access, which are common among lower socioeconomic groups[9,10]. The high prevalence of dengue fever, observed in 43.28% of the cases and significantly associated with tropical fever (OR: 1.40, P=0.02), underscores the critical need for effective vector control measures, particularly during the monsoon season when the majority of cases were recorded (56.72%).

The clinical presentation data, with fever being a universal symptom (100%), alongside common symptoms such as headache (67.16%) and muscle pain (56.72%), is consistent with the known symptomatology of tropical fevers. These findings align

with previous research, which describes similar clinical profiles for diseases like dengue, chikungunya and malaria[11]. The treatment outcomes indicate a relatively high recovery rate (79.10%), yet the occurrence of complications in 5.97% of cases and a mortality rate of 2.99% highlight the importance of timely diagnosis and treatment to reduce the morbidity and mortality associated with these diseases.

CONCLUSION

This study reinforces the need for targeted public health interventions, particularly in urban areas and among lower socioeconomic groups. Strategies should include enhanced vector control, community education on preventive measures and improved access to healthcare services. The findings also call for continued surveillance and research to monitor trends in tropical fever incidence and to evaluate the effectiveness of intervention strategies.

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