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CHANGING SYMPTOMATOLOGY IN TYPHOID FEVER: A CROSS SECTIONAL STUDY AT KHYBER TEACHING HOSPITAL, PESHAWAR

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ABSTRACT

Objectives: *To determine the frequency of shivering, intensity of fever, continuity of fever and duration of fever in culture positive patients of typhoid fever admitted to the department of child health, Khyber Teaching Hospital.*

Materials and Methods: *It was a retrospective chart review of 296 patients who were admitted to the department fulfilling our inclusion criteria. The data included was dated 15th may 2021 to 14 may 2023. The data was collected from HMIS.*

Results: *In Majority (68.2%) of the patients the fever was of shorter duration and high-grade (80%). Only 41 had intermittent fever. Similarly, only 80 (27%) had shivering and chills. Cough was present in 92 (31%) patients. Among these, 72 (78.2%) patients had high-grade fever whereas 20 (21.7%) had low-grade fever, 68 (74%) had fever for a duration of less than 3 weeks, 12(13%) had 3-4 weeks and 12(13%) had a duration of more than 4 weeks. Out of 41 (13.9%) patients with intermittent fever, 9(22%) had a duration of more than 4 weeks.*

Conclusion: *Although, cough, low-grade fever, fever of duration more than 4 weeks, intermittent fever and shivering was present in lesser frequency in patients with typhoid fever, these are still some of the presenting characteristics of fever which should be considered by the treating physician while considering a diagnosis.*

Key words: *Typhoid, fever, shivering, cough, symptomatology, duration of fever, culture positive*

INTRODUCTION

In 2017, around 11 million cases were infected with S. typhi resulting in 120,000 deaths per year globally with more than 50% of the deaths occurring in children younger than 15 years of age[1].

South-east Aisa is reported to have the highest incidence of typhoid fever of more than 100 cases per 100,000 person-years. One meta-analysis reported the annual incidence of typhoid fever per 100,000 children aged 5-15 to be 413 in Karachi, Pakistan, 180 in North Jakarta, Indonesia and 494 in Kolkata, India[2]. Asian countries contribute to more than 90% of morbidity and mortality caused by typhoid fever[3,4]. India and Pakistan rank first and second in prevalence of typhoid fever, respectively[5].

Salmonella enterica, subspecies enterica, serovar Typhi is responsible for causing Typhoid fever which is a systemic illness with feco-oral transmission[6,7]. Typhoid fever can present with signs and symptoms like fever, nausea, vomiting and abdominal pain which makes it difficult to differentiate it from other common illnesses[6]. Symptoms of typhoid fever can range from mild to the severe and appears 6-30 days after exposure to the organism. It is a high-grade fever of 39-40 °C rising gradually over many days[8].

Typhoid fever needs prompt diagnosis and treatment to avoid the morbidity and mortality associated with its complications which include typhoid intestinal perforation (TIP), gastrointestinal hemorrhage, hepatitis, cholecystitis, myocarditis, shock, encephalopathy, pneumonia, and anemia[6].

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Blood or bone-marrow culture is the gold standard diagnostic test for typhoid fever but these tests have poor sensitivity and scarce availability in endemic areas[9]. Delayed referral, distance and high cost to a tertiary care hospital leads to delay in diagnosis and treatment[10-12].

Due to the high morbidity and mortality associated with typhoid fever, its diagnosis should not be missed. For this reason, it is imperative for the treating physician to be aware of the different presentations of the typhoid fever. In this study, we will specifically focus on shivering, intermittency, intensity and duration of fever in patients with culture positive typhoid fever. This will provide an insight into considering typhoid fever in differentials of other common illnesses, avoiding the delay of diagnosis and before its complications develop. This study will be first of its kind, and may open up a new area for research and will lead to broadening of our thinking horizon.

The objective of the study is to determine the frequency of shivering, intensity and duration of fever in culture positive patients of typhoid fever admitted to the{ for blinding}

MATERIALS AND METHODS

This study was a retrospective chart review carried out between 15th may 2021 to 14th may 2023 in the Pediatric department of [for blinding]. A total of 296 charts of patients, who were culture positive for salmonella, and presented to the department of child health with history of fever were reviewed in this study. This study was approved by the Ethical Review Committee of college under the Declaration of Helsinki.

INCLUSION CRITERIA: Patients presented to the department of child health with fever, who were culture positive for salmonella typhi aged 1-15 years.

EXCLUSION CRITERIA: Children who were culture negative for salmonella. Children presenting with any other focus of infection. Age less than one year. Age more than 15 years. Patients with other chronic diseases like, Chronic liver disease, bronchiectasis, leukemia, thalassemia, myocarditis, congenital heart disease, on immunosuppressive treatment, cerebral palsy etc.

It was a retrospective chart review of the patients who were admitted to the ward fulfilling our inclusion criteria. They were managed according to the protocol of department. The data of blood cultures positive patients with typhoid fever was gathered from HMIS, and recorded reviewed from charts of patients in medical record room of [For blinded].

Results were analyzed in SPSS version 20. Categorical variables like, duration of fever, intensity of fever, intermittency, shivering with chills and cough were expressed as percentages and compared via chi-square test. A p-value less than 0.05 was considered significant.

RESULT

TA total of 296 patients presenting with fever and fulfilling the inclusion criteria, were enrolled in the study. All the patients who were culture positive for typhoid fever had a history of fever. Majority (68.2%) of the patients presented with a shorter duration of fever i.e., less than 3 weeks of history of fever. Most of the patients with typhoid fever had a history of high-grade fever (80%) whereas the rest of the patients presented with low grade fever. Among 296 patients, only 41 (13.9%) of the patients presented with a history of intermittent fever. Similarly, only 80 (27%) patients presented with history of shivering and chills. (Table 1)

Among the 31% patients with typhoid fever having cough, 72 (78.2%) patients had high-grade fever whereas 20 (21.7%) had low-grade fever. Although the result was not significant (p-value= 0.6). Among the 92 patients having cough, 68 (74%) presented with a fever for a duration of less than 3 weeks, 12(13%) with 3-4 weeks and 12(13%) had a duration of more than 4 weeks (p-value= 0.2). Similarly, among those who had cough, 32(34.7%) presented with shivering and chills with a significance level of 0.04. (Table 2)

Table 3 shows that among the 41 (13.9%) patients who presented with intermittent fever, 9(22%) presented with a duration of more than 4 weeks (p-value=0.17). Similarly, among 237 patients who had high-grade fever, only 30(12.7%) had a history of fever of more than 4 weeks whereas those who had low-grade fever, 13.6% had fever for more than 4 weeks. (p-value=0.53).

DISCUSSION

Understanding the symptomatology of Typhoid Fever is crucial for timely diagnosis and effective

management. The presentation varies widely among different individuals. Multiple factors can affect the frequency and severity of different symptoms. Some of the well-known factors are, genetic background, age of the patient, duration at presentation, pre used medications, nutritional and immunity status of the host, and possibly the virulence of the salmonella typhi. In this retrospective study, we evaluated the changing symptomatology of typhoid fever based on several key clinical indicators.

This study explores the evolving trend of fever characteristics in typhoid fever and an uncommon symptom i.e., cough as a presenting complaint as well as association of cough with the different characteristics of fever in typhoid fever.

Fever is a universal symptom of typhoid fever[13]. Typhoid fever is one of the most common diseases presenting as acute febrile illness with fever duration before the first visit being 5 days[14]. Other studies also report the median duration of fever at 7 days[15]. In our study, although, most of the patients had a history of fever for less than 3 weeks, around 13% of the patients presented with prolonged fever of duration of more than 4 weeks.

Typhoid fever typically presents as high-grade

Table 1: Characteristics of Fever

Characteristic	Frequency	Percentage
Duration of fever		
Less than 3 weeks	202	68.2
3-4 weeks	56	18.9
More than 4 weeks	38	12.8
Intensity of fever		
High grade	237	80.1
Low grade	59	19.9
Intermittency		
Present	41	13.9
Absent	255	86.1
Shivering and Chills		
Present	80	27
Absent	216	73

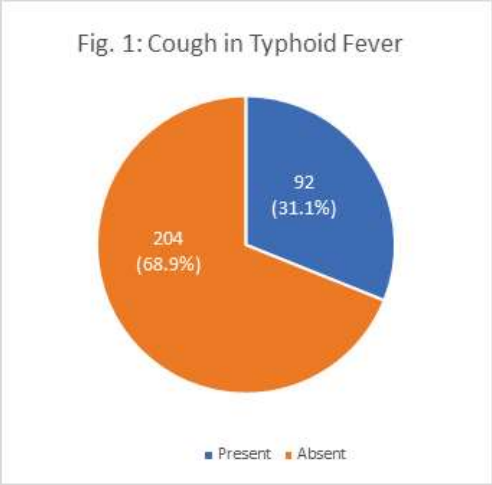

Fig 1: Cough in Typhoid Fever

Table 2: Relationship between cough and characteristics of fever.

Characteristics of fever		Cough		p-value `
		Present	Absent	
Intensity	High-grade	72 (30.4)	165 (69.6)	0.60
	Low-grade	20 (33.9)	39 (66.1)	
Duration	< 3 weeks	68 (33.7)	134 (66.3)	0.2
	3-4 weeks	12 (21.4)	44 (78.6)	
	> 4 weeks	12 (31.6)	26 (68.4)	
Shivering and chills	Present	32 (40)	48 (60)	0.04
	Absent	60 (27.8)	156 (72.2)	

Table 3: Relationship among characteristics of fever.

		Duration of Fever			p-value
		< 3 weeks	3-4 weeks	> 4 weeks	
Intermittency	Present	25 (61)	7 (17.1)	9 (22)	0.17
	Absent	177 (69.4)	49 (19.2)	29 (11.4)	
Intensity	High-grade	165 (69.6)	42 (17.7)	30 (12.7)	0.53
	Low-grade	37 (62.7)	14 (23.7)	8 (13.6)	

fever[16]. Other studies report a high-grade fever of >101°F (38°C) in 97% of the patients[17] but in this study the proportion of patients with high-grade fever is relatively less (80%).

The temperature in typhoid fever does not return to normal with reaching higher peaks every day and eventually becoming unremittent[18]. In contrast, in our study, around 14% of the patients had a history of intermittent fever. Another study from south-India reported staggering 96% of patients having typhoid fever of intermittent type[19].

Shivering and chills were one of the associated features of fever in typhoid fever with as many as 27% of the patients reporting this feature. One of the recent studies also reported chills to be one of the common features of typhoid fever (54%)[19].

A study in Bangladesh carried out from 2017-19 reported cough as one of the symptoms of typhoid fever with relatively lower frequency i.e., 15%[15] as compared to our study (31%) and one carried out in India in 2020 with an even higher frequency i.e., 68%[19].

To the best of our knowledge, there were no studies carried out to compare the characteristics of fever with cough and to find any association among the characteristics of fever among itself. Although our results were not significant regarding intensity and duration of fever in patients who presented with cough, 21% had a history of low-grade fever and around 13% presented with a fever duration of more than 4 weeks. As many as 22% of patients with intermittent fever, presented with a history of chronic cough of more than 4 weeks While this is a smaller proportion of presentation, still, low-grade fever, intermittent fever and a chronic history of cough could be the presenting complaint of typhoid fever. Similarly, there was a significant association between patients who presented with shivering/chills and cough.

This highlights the need for clinicians to maintain a broad differential diagnosis when evaluating patients with fever and respiratory symptoms.

This study provides valuable insights into the changing symptomatology of typhoid fever, emphasizing the heterogeneity of clinical presentations. Healthcare providers should remain vigilant in considering typhoid fever in their differential diagnosis, especially in regions where the disease is endemic. Early diagnosis and appropriate management are essential for reducing morbidity and mortality associated with typhoid fever.

CONCLUSION

TOur study signifies that patients with typhoid fever may have shivering and intermittent fever. Moreover, they may have low grade and prolonged fever. Practicing physicians should consider typhoid fever in patients with these symptoms as we belong to an endemic area . It is worth noting that our study has certain limitations, including the reliance on retrospective data, which limits our ability to establish causation or track individual patient outcomes. Further longitudinal and prospective research is needed to elucidate the evolving clinical picture of typhoid fever.

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