

Recent Status and Seasonal Variation of Typhoid Fever in Bharatpur District, Rajasthan

Dr. Jitendra Kumar Tiwari¹, Dr. Avinash Pandey^{2*}, Mr. Neeraj Kumar³

¹Senior Demonstrator, Department of Microbiology, Medical College, Bharatpur, Rajasthan, India

²Associate professor, Department of Pathology, Medical College, Bharatpur, Rajasthan, India

³Microbiologist, RBM Hospital, Bharatpur, Rajasthan, India

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*Corresponding author

Dr. Avinash Pandey

Email:

avinashpande27@gmail.com

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Abstract: In many developing countries, typhoid fever is endemic. Early diagnosis is important for appropriate treatment on time. Typhi dot is important diagnostic tool for early diagnosis of typhoid fever. In the current study, samples from 2030 febrile cases referred to RBM Hospital, Bharatpur Medical College lab were screened for serum IgM and IgG for Salmonella typhi by Typhi dot test. Results showed that about 911 (44.88%) patients had both IgM and IgG antibodies against Salmonella typhi. Male patients were more commonly affected than female patients. Highest frequency of positive cases was seen during the month of October. Age group >15-44 was most likely affected among different age groups. This study suggested that still we are far behind in improving sanitation and elimination of such controllable disease. Therefore prompt measures should be taken to control the disease especially during hot season by vaccination, improved sanitation and education as well.

Keywords: Typhoid fever, Typhi dot, IgM, IgG, Vaccine.

INTRODUCTION

In developing countries; the typhoid fever is occurring as emerging problem. The typhoid caused by Salmonella, which is further categorized on the basis of serotype typhi. In endemic areas typhoid is a major health issue, where the facilities of safe drinking water and poor sanitation.

It is estimated about 22 million new cases of typhoid occur each year and 200,000 of these resulting in death worldwide [1,2]. In Southeast Asia and Central South reported numbers of cases are more than 100 per 100,000 persons per year [3]. India is located endemic region and incidence rate is 214.2 per 100,000 persons per year of typhoid fever [2,4].

Commonest risk factors of typhoid transmission are contaminated food, drinking water, miserable sanitation condition, close interaction with typhoid patients or carriers, education, flooding, personal hygiene and travelling to endemic regions and in addition, the climatic condition such as, rainfall [5-8].

The clinical representation of typhoid may not be clarified so initial diagnosis of disease is significant for patients. Laboratory examinations directly depend on the day of illness. A blood culture test based on 70-75% of the first week of illness and is still as the gold standard for diagnosis [9]. Rapid immunoassays have been commonly used for a few years with variable results in the world [10-13]. The present study aims to determine the typhoid fever in our set-up and its seasonal variation.

METHODS

The Study was performed in the Department of Microbiology, RBM Hospital, Bharatpur Medical College, Bharatpur (Rajasthan). Total 2030 blood samples from typhoid suspected patients were collected and tested in the laboratory for typhi dot test. The Typhi dot test is based on the presence of specific IgM and IgG antibodies against typhoid antigen, which is imprinted on nitrocellulose strips. The reaction tray was divided into 3 columns marked as G, M and control. The 45 µL of serum sample was dispensed in the sample well and after that 45 µL of buffer was added. The results were read and interpreted within 15 minutes.

RESULTS

A total 2030 serum samples from typhoid suspected patients were collected and tested for IgM

and IgG antibodies against Salmonella typhi and 911 (44.88%) were found positive.

Out of total suspected patients, 1210 (59.61%) were male and 820 (40.39%) were female patients. Out of total positive patients, 482 (52.91%) male patients were positive and 429 (47.09%) female patients were positive for typhoid (shown in Table1).

When suspected and positive patients were analyzed according to different age groups it was

found that the highest number of the patients belong to age group >15-44 years. However, >44-50 years were least affected. All these results are shown in table 2.

Positivity pattern of typhoid among patients in different months was analyzed from June 2017 to May 2018. According to which higher occurrence of positive cases was seen during the month of October and May. The figure 1 shows the detailed frequency of positive cases along with suspected patients

Table-1: Sexwise distribution of patients

Sex	Tested	% (n=2030)	Positive	% (n=911)
Male	1210	59.61	482	52.91
Female	820	40.39	429	47.09
Total	2030	100	911	100

Table-2: Age group wise distribution of patients

Age Group	Tested	% (n=2030)	Positive	% (n=911)
Children (0-15 years)	761	37.49	289	31.72
Young (15-45 years)	923	45.47	441	48.41
Middle (45-50 years)	179	8.82	74	8.12
Elder (>50 years)	167	8.23	107	11.75
Total	2030	100	911	100

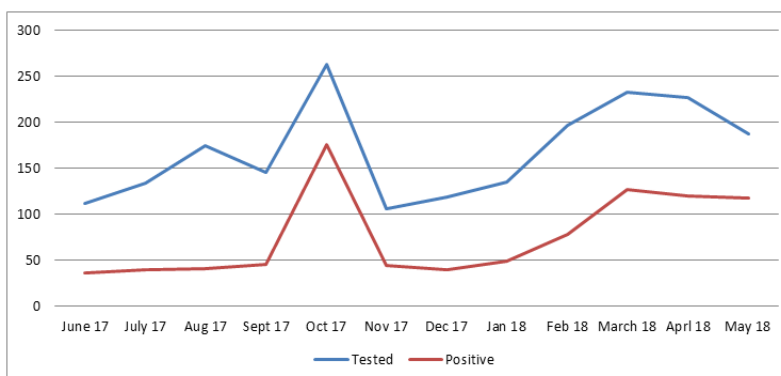


Fig-1: Seasonal distribution of suspected and positive patients

DISCUSSION

During the treatment of typhoid fever, emergence of multidrug resistance among type strains is one of the chief causes of complications faced [13]. Delay in the diagnosis and beginning of effective treatment is associated with increased risk of complications during the course of the disease [14]. To meet the need of rapid and accurate diagnosis of typhoid fever, Typhi dot is the test of choice. It detects antibodies to outer membrane protein (OMP) antigen present on *S. typhi* [15]. Positive results can be obtained within 1 hour and interpreted visually. Although blood culture is considered as a gold standard [16] in the diagnosis of typhoid fever, but delay in its result has led to the use of other means of diagnostic tools. According to the different research study typhi dot was found to be 100% sensitive and 95.5% specific [14,16-17].

In our study, out of 2030 patients, 911 (44.88%) have antibodies against Salmonella typhi. Male patients (52.91%) are more commonly affected than female (47.09%). It is in favor of the results seen in a study done in Abbottabad in 2011 and Tamil Nadu in 2014 [18,19].

Moreover, study of positive cases, according to the age group shows the majority of the patients belong to the mean age of 37years and least affected age group was older age group. Mostly young people are affected which is in accordance with the results of study done at the Northern Institute of Medical Sciences (NIMS) and Ayub Teaching Hospital (Abbottabad) in 2011 where mean age of the study group was 26.31±11.8 (SD) years [19].

When positivity pattern of antibodies during different months was analyzed, it was found that there

is a peak incidence of positive cases during October whereas moderately high frequency was seen in March, April and May. It is consistent with the results of the study done by Olsen S. J, et al in Vietnam (endemic area for Typhoid fever) in 2004 [13].

Since, Typhi dot is an inexpensive and reliable sero-diagnostic tests, easily available commercially requiring no expert technical skill [20] Physicians can diagnose and initiate therapy early with the help of this test having high sensitivity and specificity [19]. In order to eradicate the disease at governmental level measures should be taken, to control the disease especially during hot season by vaccination, improved sanitation and education as well.

CONCLUSION

In brief, our study represents that typhoid is still a problem of developing countries like India and data was representing the prevalence of the disease in the month of October. Although most developed countries saw declining rates of typhoid fever throughout the first half of the 20th century due to vaccinations and advances in public sanitation, but still we need to improve sanitation and pollution of the waters and edibles in order to get rid of the disease.

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