

Baseline Widal Titre Amongst Healthy Individuals in Ahmedabad, India



Medical Science

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ABSTRACT

Single Widal test always carries a risk of wrong interpretation as 4-fold rise in titres are required for confirmation so this study was carried out to determine the baseline Widal titre of community. Blood samples (n= 200) were tested by Widal slide agglutination test. Of the 200 serum samples, 110 samples were positive for agglutinins ($1 \geq 20$) and 90 are negative ($1 \leq 20$). However, 94% samples showed a titre which was equal to or less than 1 in 40 to the O antigen and 86% samples had a titre which was equal to or less than 1 in 40 to the H antigen of Salmonella typhi. Based upon the results of our study, the baseline titre for the O and H antibodies of S. typhi was found to be 1: 40.

Introduction

Due to poor sanitation and poor water supply in developing countries water borne infections are very common. As other endemic diseases, Enteric fever continues to be one of the major health problems in India (1). F. Widal developed this test and it is still used in developing countries for the diagnosis of enteric fever as newer methods are still lacking (2). This test detects the antibodies against the O and H antigens of Salmonella typhi and against the H antigens of Salmonella paratyphi A and B.

For the diagnosis of enteric fever Widal test is usually ask for, but a single Widal test always carries a risk of wrong interpretation as 4-fold rise in titres are required for confirmation. However, before 4-fold rise in titres, clinicians prescribe antibiotics to the patients. Hence a baseline titre amongst healthy individuals in a particular geographical area is required for the interpretation of single Widal test. Healthy individuals from different geographical area have different baseline Widal titres and this depends upon the endemicity of typhoid in each area, which has been changing over time. Hence a regular measurement of baseline titres in different geographic area has to be carried out for the proper interpretation of the Widal test (3),(4),(5).

So to serve this purpose this study was carried out to determine the baseline Widal titre (titre of the antibodies to the O and H antigens of S. typhi and to the H antigens of S. paratyphi A and B) amongst apparently healthy individuals in Ahmedabad (Gujarat).

Material and Methods

This study was conducted in the Department of Microbiology, B. J. Medical College, Ahmedabad, Gujarat India. After obtaining their informed consent verbally, non-repetitive blood samples were collected from apparently healthy individuals (n= 200) of the age group of 18-50 years, of both the sexes, who accompanied patients. All individuals were questioned about past illness including previous Widal test and typhoid vaccination and any suspicious samples are excluded in the study.

Widal slide test kit available commercially containing Salmonella enterica serovar typhi O and H antigens, the Salmonella enterica serovar paratyphi AH antigen and the paratyphi BH antigen were used. The slide agglutination test was carried out. 80 ul, 40 ul, 20 ul, 10ul & 5ul of serum was placed on Widal slide and drop of each O, H, AH and the BH antigens are added and slide was kept on shaker for 1 minute. A negative control was included in each batch of the tests. The results were interpreted

immediately. The baseline titre for the O, H, AH and the BH agglutinins was the highest titre which was shown by any of the study samples.

Results

A total of 200 serum samples were screened by using the Widal slide agglutination test. (Table- 1) shows the results of the Widal test.

Out of 200 serum samples, 110 serum samples were positive for agglutinins ($\geq 1:20$) and 90 serum samples were negative for agglutinins ($< 1:20$). The distribution of the samples with an antibody titre of $\geq 1:20$ against different serotypes of Salmonella enterica subsp. enterica showed an O agglutinin in 58 samples (52.7%), an H-agglutinin in 69 samples (62.7%), an AH agglutinin in 6 samples (5.45%) and an BH agglutinin in 4 samples (1.8%). (Table- 2)

Table-1 : Results of Widal test

Widal test Result	Total Numbers	Percentage
Positive ($\geq 1:20$)	110	55%
Negative ($< 1:20$)	90	45%
Total	200	100%

Table-2: Results of Widal test showing different Agglutinins

Widal test Result	"O" Agglutinins	"H" Agglutinins	"AH" Agglutinins	"BH" Agglutinins
Positive no.	58	69	6	4
Percentage	52.7%	67.7%	5.45%	1.8%

Discussion:

This study was carried out to know the baseline titre of agglutinins against Salmonella typhi and Paratyphi.

Among the 200 blood samples of apparently healthy persons who were tested, 110 (55%) were positive for agglutinins for the Salmonella serotypes. The highest level of the Widal titre was found to be 1:80 for the O antigen and it was 1:160 for the H antigen of Salmonella enterica serovar typhi. However, out of all positive "O" agglutinins, 94% of the samples showed a titre which was equal to or less than 1 in 40 to the O antigen and out of all positive "H" agglutinins, 86% samples had a titre which was equal to or less than 1 in 40 to the H antigen of Salmonella

enterica serovar typhi. This suggest that in community the baseline titre for the O and H antibodies of *S. typhi* is 1: 40. These results are with agreement with earlier studies.(6,7)

The baseline titre for the 'H' antigen of *Salmonella enterica serovar paratyphi A* was found to be $\leq 1:20$ in all the 6 samples. 4 samples had a titre of $\leq 1:20$ for the *Salmonella enterica serovar paratyphi B* 'H' antigen. Our findings were in agreement with the reports of previous studies (8).

The results which were obtained in the present study were in agreement with the results of previous studies which were done by Punia JN1 and with those of few other studies which were conducted in similar environments (1) (9),(10).

Conclusion:

Baseline titre helps in diagnosis of enteric fever as a single diagnostic tool in particular geographical area. As per our study, significant titre of the 'H' agglutinins and the 'O' agglutinins of *Salmonella enterica subsp. enterica serotype typhi* was $\geq 1: 80$. While the significant titre of the 'H' agglutinins of *Salmonella enterica subsp. enterica serotype paratyphi A* and 'H' agglutinins of *Salmonella enterica serotype paratyphi B* was $\geq 1: 40$.

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