

Research Article



Investigate Prevalence of Typhoid Fever among Medical Technical Institute/ Baghdad Students

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ABSTRACT

Typhoid fever is the most serious infectious disease threats to public health or global scale. This study was designed to find out prevalence of typhoid fever and determination types of infection among students in medical technical institute /Baghdad and the accurate test was widal test. Data were collected from November 2017 to March 2018, from 104 blood samples of students who presented in the medical technical institute/Baghdad, the study included both sexes diagnosis was made randomly by performing the serological test widal test, were then serially diluted with 0.85% saline from 1/40 to 1/280. Our results shows that the higher percentage rate among infected and carriers male, also our results suggested that the type of infections were chronic depending upon appearance of the antibodies of flagellar antigen (H), Carrier people can be a source of transmission disease to healthy people especially family numbers who are in direct contact.

Keywords: Salmonella, Prevalence, Enteric fever, Widal test.

INTRODUCTION

Typhoid fever is a global health problem, its real impact is difficult to estimate because the clinical picture is confused with those of many other febrile infections¹.

Typhoid fever is caused by (*S.typhi*). The bacterium is transmitted by fecal-oral route, through contaminated water or food source. *S. typhi* is a multi-organ pathogen that inhabits the lymphatic tissues of the small intestine, liver, spleen and bloodstream of infected humans^{2,3}. Enteric fever is reported more frequently in children above five years of age having complications in more than one third of the patients^{3,4}.

Enteric fever continues to be endemic in economically poor countries, although it has been eradicated from economically stable and developed nations by well-organized sanitation and hygienic water supply^{4,5}. It is the disease from prehistoric dates that has afflicted human populations due to contaminated water and food supplies⁶. In the industrial world the realization of fecal contamination of food and water as the main source of transmission of the disease, helped to control and prevent typhoid fever in areas where it is now curtailed to local epidemics^{7,8}. The disease is endemic in the Indian sub-continent, South-East Asia, Africa, the Middle-East, South and Central America, where provision of pure water supplies and sewage control are inadequate^{6,5}. In developing counters ,typhoid fever causes least 5% of all deaths with markedly different rates where typhoid fever is endemic⁷.

The purpose of this study was to find the prevalence of typhoid fever diseases and determination types of infection among students in medical technical institute / Baghdad

METHODS AND MATERIALS

Patients

One hundred and four blood sample were collected, 75 male and as very few females donated blood, only 29 blood samples were collected from women, none of the volunteers had a history of recent infections including malaria, viral hepatitis, tuberculosis or other infectious diseases according to multi choice questionnaires were administered to one hundred and four (104) students. The blood samples were collected in EDTA tubes and transportation to the laboratory as short as possible than keep them cold. The clinical analysis was performed using widal test which performed according to the manufactures protocols, this technique detect the presence of antibodies against the particular pathogens.

Serum

For serological purpose, 1-3 ml of blood should be inoculated into a tube with anticoagulant, after clotting has occurred the serum should be separated and stored at frozen if longer -term storage is required.

Widal test

Rapid slide (screening test)

- 1-place one drop of positive control on one reaction circles of the slide.
- 2-pipette one drop of saline on the next reaction circle (-ve).
- 3- Using micro pipette dispense 80 µl of the patient serum tested on to the remaining four reaction circle.
- 4-Add one drop each of O and H, A H, BH antigens to the remaining four reaction circles.



5-Mix contents of each circle uniformly over the entire circle with separate mixing stick.

6-Rock the slide gently back and forth and observe for agglutination macroscopically within one minute.

Semi quantitative methods

1-Pipette one drop of isotonic saline into the first reaction circle and then place 5, 10, 20, 40, 80 ul of the test sample on the remaining circles.

2-Add to each reaction circle a drop of the antigen which showed agglutination with the test sample in the screening method.

3-Mix the content of each circle uniformly over the reaction circles.

4-Rock the slide gently, observes for agglutination within one minute.

Results and discussion

Enteric fever has continued to pose a serious threat to public health especially in economically poor countries where level of hygiene is below⁹. our results were interpretation according to table (1).

Table 1: Interpretation of our results.

Titer/Ab	Typhoid fever	Paratyphoid fever A	Paratyphoid fever B	Vaccination
TO	160	80	80	-
TH	640	-	-	320
AO	80	320	80	-
AH	-	640	-	160
BO	80	80	320	-
BH		-	640	160

In our study 104 blood samples collected from volunteers were diagnostic by using Widal test (screening test), which measures agglutination antibody level against O and H antigens. Table (2) shows the effect of sex on typhoid fever, our results shows that highest occurrence of typhoid fever was observed among males carrier at 46.1% while female recorded the least 2.9% compared with infected patients among male and female at 20.2% and 21.2% respectively, while the total non-infected

among male and female at 9.6%, the different between infection rate in males and females dependent on many factors such as a lack of health awareness for the rural community as well as swimming in contaminated river water, especially males. Males are often know to pose a care-free attitude to the hygienic condition of the foods they eat or the environment where such as prepared^{10, 11}.

Table 2: Distribution of cases according to gender

Gender	Non –Infected		Carrier		Infected		Total	
	no.	%	no.	%	no.	%	no.	%
Male	6	5.8	48	46.1	21	20.2	75	72.1
Female	4	3.8	3	2.9	22	21.2	29	27.9
Total	10	9.6	51	49.1	43	43.4	104	100.0%

From figure (1) showed that out of 29 (27.9%) females blood samples 22(21.2%) were positive following a widal agglutination (screening test) compared with carrier cases 3(2.9%),while from the males carrier samples 48(46.1%) was higher than the male infected samples 21(20.2%) by using rapid slide (screening test).

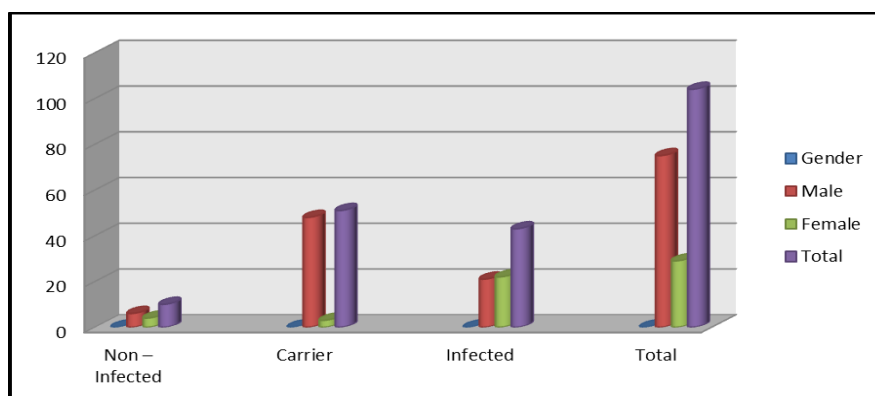


Figure 1: Illustrated the number of cases study among male and female

Carriers asymptomatic have the ability to infect due to lack interest in personal hygiene and thus transmitted bacteria through eating or food preparing^{12, 13, 10}.

The males were more vulnerable to infection due to eating exposed food outside their home, which increased the chance of being infected^{4, 15}.

Out of ninety four (94) positive blood samples from infected and carrier cases among male and female by

widal test agglutinates test, Initial positive screening tests were further diluted for the determination of the strength of antibodies, from figure (2) showed that 43(45%) had typhoid fever case at TO≤ 160, TH≤ 640 and 39(41.5%) had paratyphoid fever A at AO≤ 320 and AH ≤ 640 while the least percentage at paratyphoid fever B At 12(12.8%) BO≤ 320 and BH≤ 640. Figure (2).

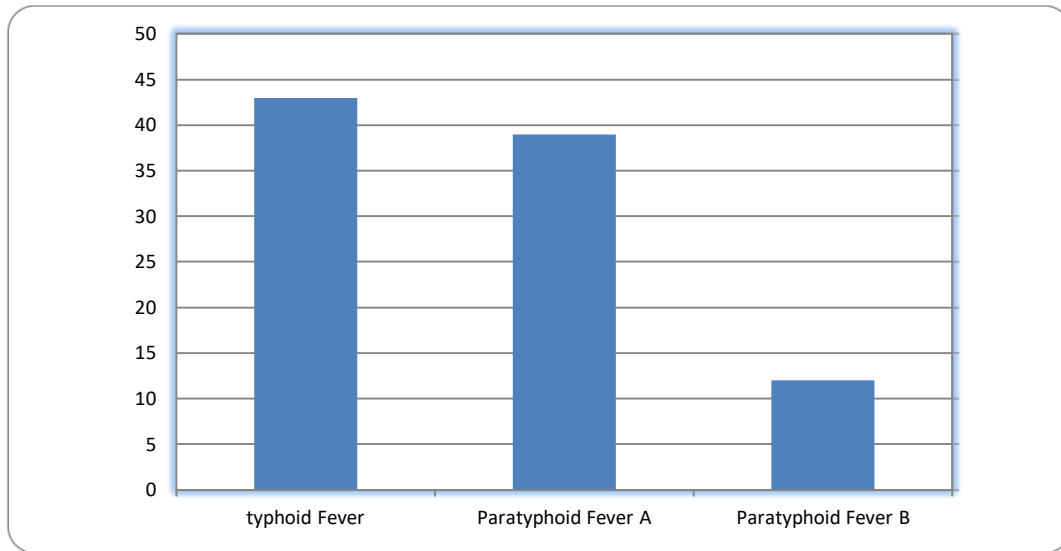


Figure 2: Acute or chronic infection according to the antibodies patients.

A diagnostic widal agglutination titer of O and H agglutinins equal 80 will be considered useful in the diagnosis of typhoid fever in our environment¹⁶.

Our results suggested that the type of infection acute or chronic depending upon appearance of the antibodies and its speed (fig2), in acute infection antibodies of

somatic antigen (O) appear faster and its rate increased at the time than antibodies of flagellar antigen (H) and remain for long time up to several years, the presence of higher percentage rate of IgM refer to acute infection while IgG refer to chronic infection¹⁷.

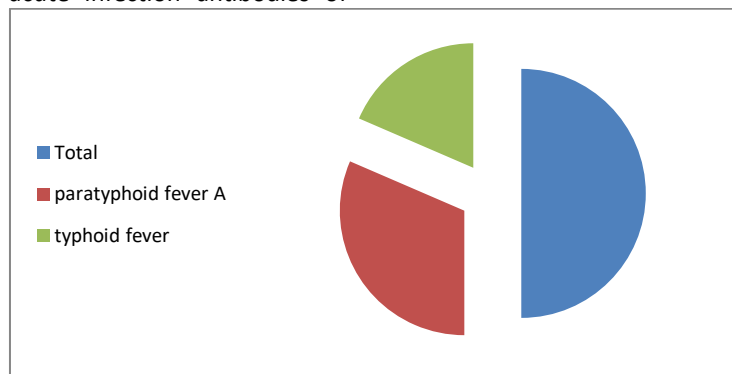


Figure 3: Types of enteric fever, among students who have a family member is infected.

Our results shows that the number of students who have a family infected, 54/94 (57.44 %), who have typhoid fever 34/54 (63 %) and 20/54(37 %) who have paratyphoid fever A.

Carrier people can be a source of transmission disease to healthy people especially family numbers who are in direct contact, carriers asymptomatic but have the ability to infected due to lack interest in personal hygiene and thus transmitted bacteria through eating or food

preparing among numbers of the same family, salmonella can survive in soil with feces for 6 weeks and in water for at least 4 weeks^{18, 19, 20} figure³. It was concluded that hygiene play an important role in reducing disease and must culture stool to ensure that the person is not disease carrier²¹, salmonella remain in two places, in the bile follicle and then get out with stool and the second place in kidney and get out with urine²².

CONCLUSION

1. Based on the above findings, it may be concluded that higher incidence of typhoid fever were found among the male students who consumed unsafe water and food from sources other than home.
2. The most patients by typhoid fever have a family members infected.
3. Highest occurrence of typhoid fever was observed among carrier males at 64%.
4. Sex factor has an important affected for disease.

Recommendation

1. Give great importance to typhoid fever patients because it is a common epidemic disease in the province Baghdad and its impact on patients immune.
2. Reliance on modern diagnostic techniques such as ELISA as one of the most accurate and specialized methods of detecting disease.
3. Medical diagnostic checkups for food workers and attention to personal hygiene.
4. Food workers and passenger to areas where the disease is present should be vaccinated.
5. Pay attention to personal hygiene and health condition in all places.
6. Health education messages for the vulnerable communities need to be adapted to local conditions and translated into local languages.
7. Typhoid can be transmitted by chronic carriers who do not apply satisfactory food-related hygiene practices. These carriers should be excluded from any activities involving food preparation and serving.
8. In urban areas, control and treatment of the water supply systems must be strengthened from catchment to consumer.
9. In rural areas, wells must be checked for pathogens and treated if necessary. Drinking-water can be made safe by boiling it for one minute or by adding a chlorine-releasing chemical.

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