

Prevalence of Typhoid and Paratyphoid fever in a tertiary care hospital of Kathmandu valley

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Abstract

Typhoid or enteric fever is caused by *Salmonella* serotype typhi and paratyphi. It is one of the major public health problem in developing countries including Nepal. In recent years, increased urbanization and growing population within Kathmandu valley, attributed mainly to improper sanitary condition and fecal contamination of drinking water. These all factors contributes to a very high prevalence of typhoid fever through out the country.

Methods

This study was laboratory based study carried out six month period from march 2017 to August 2017 at microbiology lab in Nepal Medical college.

Results and conclusion

In the present study, the prevalence of enteric fever is mainly caused by *Salmonella*. Typhi than *Salmonella* Paratyphi A was observed.

Introduction

Typhoid fever is caused by the bacteria *Salmonella* Typhi and *Salmonella* Paratyphi. Due to ingestion of food and water usually contaminated by urine or feces of infected carriers. Typhoid fever is life threatening systemic illness and a major public health problem in many countries including Nepal. Likewise, it is an acute and invasive infection of the gastro intestinal system. This disease is more prevalent in children and young adults (1).

In Nepal, typhoid fever is common in all populated areas. In recent years, increased urbanization, and growing population density within the major cities and the widespread lack of access to clean water and food have lead to a high prevalence of typhoid through out the country (2). In Nepal typhoid fever, commonly known as bisham jwar. It is prevalent in mountains, valley and southern terai region as an endemic. Its peak incidence occurring from from May to August. In Nepal *salmonella* serovar is the most common single pathogen isolated in blood cultures.

Prior reports from Kathmandu link low socioeconomic status and unsanitary living condition to higher prevalence of typhoid fever. The disease is characterized by prolonged fever, abdominal distension, constipation, headache, rash, malaise, loss

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of appetite, nausea, vomiting and leukopenia. (3).

Approximately, 10% of patients recovering from typhoid fever excrete *Salmonella* Typh in the stool for three months and in the past 2 to 3% become permanent carriers. These infections have great potential for epidemic spread therefore

Objectives

1. To find out the more prevalent types of *salmonella* serovar in typhoid fever.
2. To find out the genderwise distribution of *salmonella* serovar in typhoid fever.
3. To find out the seasonal variation of *Salmonella* serovar in typhoid fever.

Inclusion and exclusion criteria

Inclusion criteria

In this study, patients clinically suspected of typhoid fever were enrolled.

Exclusion criteria

1. The patients already have antibiotics treatment and
2. Repeated samples from the same patient were excluded.

Material and methods

Materials

Blood samples from typhoid fever suspected patients were collected.

Methods

Alltogether 400 patients suspected of having typhoid fever were collected at Nepal Medical College (NMC). Different age group and sex visiting in Microbiology Laboratory for blood culture were included in the study from April to September 2017. Blood samples were collected aseptically. Samples collecting site were also made sterile with 70% alcohol.

Specimen collection, processing and identification of Salmonella isolates

Blood collection for paediatric patients was 3 ml and 5 ml for adults patients were collected and incubated into Brain Heart Infusion (BHI) broth at the ratio of 1:10. After incubation at 37°C for 24 hours. After 24 hours of incubation, if there is seen turbidity in BHI broth, it was then sub cultured into MacConkey agar, blood agar and chocolate agar respectively.

Next day, if there was seen non lactose fermenter pale colour colonies then it was further confirmed by using standard microbiological techniques. Such as biotyping e.g. colony morphology, staining reaction and biochemical characteristics and serotyping using specific antisera i.e. Denka Seiken Co. Ltd., Tokyo, Japan. Likewise patients information such as patient name, age, Sex, Ward, bed no (if admitted), brief clinical history, duration of hospital stay and history of antibiotic use were taken.

Safety

Specimens were handled, processed and disposed by using standard guidelines for biohazardous materials. Spills were immediately disinfected.

Quality control

A positive control and a negative control were included in each run.

Table 1. Distribution of typhoid fever according to gender

Male		Female		Total
No.	%	No.	%	
120	60	80	40	200

The above table shows the distributon of typhoid fever according to gender

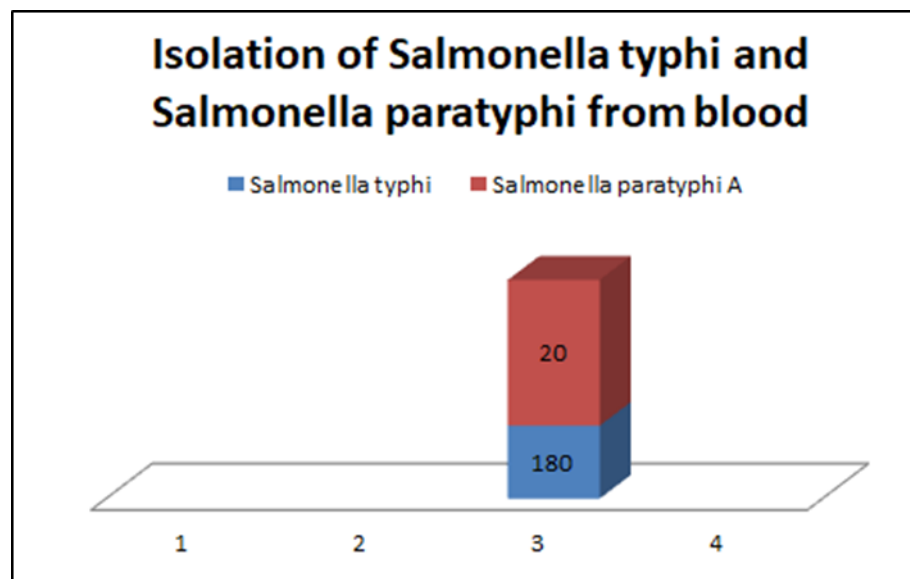


Figure 1. Prevalence of *Salmonella typhi* and *Salmonella paratyphi A* isolated from blood

Results

The study subjects was suspected typhoid fever patients visiting in Nepal Medical College, jorpati. In this study, total 400 blood samples were proceed both from out patients and inpatients visiting in hospital. In this study, male population were more infected (60%) than female population (40%) (Table:1). Likewise, in total isolated cases (200) of *Salmonella* spp, *Salmonella typhi* (180) was more prevalent organism than *Salmonella paratyphi A* (Fig: 1).

Discussion

Nepal is a pocket area of typhoid endemic city due to cross contamination of food and drinking water with sewage and poor sanitation status. Estimation of the disese burden and its etiology would be helpful in the development of effective prevention and control intervention (5). Out of 200 cultures confired typhoid fever cases, 180 were caused by *salmonella typhi* and 20 were by *Salmonella Para Typhi*. Such a higher prevalence of typhi serovars in our study complies with the study by Adhikari et al, (64%) and (35.9%) of *Salmonella* and *Salmonella* respectively (6). In accordance to this study such a high prevalence of *Salmonella Typhi* was due to contaminated drinking water supply ia small Nepali town has recently been described (11). However Shirawa et al documented *Salmonella Paratyphi* are more prevalent serovar in

Kathmandu, Nepal (7). Which is supported by another study of Pramod et al., (35.9%). *Salmonella* and (64.1%) *Salmonella* Paratyphi (8). Although, there is no such well established cause of serovar variation in typhoid cases. Higher incidence of *Salmonella* Typhi might be due to waterborne transmission of *Salmonella* Typhi as it usually involves smaller inocula than paratyphoid achieved through food borne transmission that require large inocula (9).

In accordance to this study, more prevalent rate of typhoid cases was in male than females (10). Which was done by **Mohanty et al 2006** in All India Institute of Medical Science. The one of the strong reason for such a high rate in males were that males in Nepal, at present also usually worked outside their homes and also eat street food and drinking water are liable to contaminated.

Conclusion

This study shows the frequency of typhoid fever is higher in male population compared to female population. Likewise, the result of this investigation shows the prevalence organism for causing typhoid fever is *Salmonella* typhi than *Salmonella* paratyphi A. It might be due to the reason that *Salmonella* typhi requires smaller number to cause the disease. But for causing paratyphoid fever, the causative organism i. e. *Salmonella* paratyphi A requires only the small numbers.

List of abbreviation

Not applicable

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Conflict of interest

Author declares that there is no conflict of interest.

Source of support

None

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