**International Journal of Medical and Health Research**
**ISSN: 2454-9142, Impact Factor: RJIF 5.54**
**www.medicalsciencejournal.com**
**Volume 3; Issue 4; April 2017; Page No. 05-07**

# Profile of Typhi fever among children: A clinical study

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**Abstract**
**Background:** Typhoid fever is a preventable infectious disease caused by gram negative bacteria Salmonella typhii (S. typhi) and is still a major global threat to public health. It has high mortality and morbidity rate. The present study was conducted to assess profile of typhoid fever in children.
**Materials & Methods:** This study was conducted in the department of pediatrics from year 2010- 2015. It included 326 children who diagnosed with typhoid fever if presented with fever (temperature >38°C) for at least 3 days and their blood culture yielded S. typhi. Common symptoms were also recorded.
**Results:** Out of 326 patients, 156 were boys and 170 were girls. The difference was non-significant (P < 0.2). Patients <1year were 10 boys and 6 girls. 1-2 years had 13 boys and 7 girls. 2-5 years had 43 boys and 54 girls. 5-10 years had 57 boys and 80 girls. >10 years had 33 boys and 23 girls. The difference was non – significant (P > 0.05).
Common symptoms were fever in boys (156) and girls (170), vomiting in boys (82) and girls (107), diarrhea in boys (45) and girls (58), coated tongue in boys (22) and girls (28), hepatomegaly in boys (132) and girls (140) and splenomegaly in boys (120) and girls (153). The difference was non - significant (P > 0.05).
**Conclusion:** Typhoid fever is common among children. Proper sanitation and hygeine are important to prevent typhoid. Careful food preparation and washing of hands are crucial to prevent typhoid.

**Keywords:** typhoid fever, salmonella typhi, splenomegaly

## Introduction

Typhoid fever is a preventable infectious disease caused by gram negative bacteria Salmonella typhii (S. typhi) and is still a major global threat to public health. It has high mortality and morbidity rate. Typhoid fever, also known as typhoid causes symptom which may vary from mild to severe and usually begin six to thirty days after exposure [1].

There is a gradual onset of a high fever over several days. Weakness, abdominal pain, constipation, and headaches also commonly occur. Diarrhea is uncommon and vomiting is not usually severe. Some people develop a skin rash with rose colored spots. In severe cases there may be confusion. Without treatment symptoms may last weeks or months. Other people may carry the bacterium without being affected; however, they are still able to spread the disease to others. Typhoid fever is a type of enteric fever along with paratyphoid fever [2].

In India, typhoid fever is endemic with morbidity ranging from 107–229 /1,00,000 population.

A typhoid vaccine can prevent about 30% to 70% of cases during the first two years [9]. The vaccine may have some effect for up to seven years. It is recommended for those at high risk or people traveling to areas where the disease is common. Other efforts to prevent the disease include providing clean drinking water, better sanitation, and better hand washing [3]. Until it has been confirmed that an individual's infection is cleared, the individual should not prepare food for others. Treatment of disease is with antibiotics such as azithromycin, fluoroquinolones or third generation cephalosporins. Resistance to these antibiotics has been developing, which has made treatment of the disease more difficult [4]. There is a wide spectrum of clinical presentation and with the emergence of multidrug resistant typhoid now a days, the treatment has become still more complex.

The present study was conducted to assess profile of typhoid fever in children.

## Materials & Methods

This study was conducted in the department of pediatrics from year 2010- 2015. It included 326 children who diagnosed with typhoid fever if presented with fever (temperature >38°C) for at least 3 days and their blood culture yielded S. typhi. Case records were analyzed for clinical data, laboratory parameters, treatment and follow up details. Following parameters were considered for typhoid fever.

Leucopenia: When total WBC count < 4000 cells/mm$^3$, Leucocytosis: When total WBC count > 10,000 cells/mm$^3$, Eosinophilia: When absolute eosinophil count (AEC) >450 cells/mm$^3$.

6. Blood culture: 5 ml of blood was collected by sterile venepuncture technique and inoculated in 20 ml of BacT/Alert PF broth bottles and presence of microorganism was considered.

For detection of serum transaminases (ALT, AST), if their values were above normal (15–45 IU/L) were classified as mild (up to 3 times above normal), moderate (3–20 times above normal) and marked (> 20 times above normal).

## Results

Table I shows that out of 326 patients, 156 were boys and 170 were girls. The difference was non-significant (P < 0.2). Table II shows age wise distribution of patients. Patients <1year were 10 boys and 6 girls. 1-2 years had 13 boys and 7 girls. 2-5 years

had 43 boys and 54 girls. 5-10 years had 57 boys and 80 girls. >10 years had 33 boys and 23 girls. The difference was non – significant (P > 0.05).

Graph I shows that common symptoms were fever in boys (156) and girls (170), vomiting in boys (82) and girls (107), diarrhea in boys (45) and girls (58), coated tongue in boys (22) and girls (28), hepatomegaly in boys (132) and girls (140) and splenomegaly in boys (120) and girls (153). The difference was non - significant (P > 0.05).

Table III shows that as compared to study by Sinha *et al*, Walia *et al* and Sididiqui *et al*, all symptoms were seen which were also seen in our study except Coated tongue which was absent in other studies.

**Table 1:** Distribution of patients

| Total- 326 | | |
|---|---|---|
| **Boys** | **Girls** | **P value** |
| 156 | 170 | 0.2 |

**Table 2:** Age wise distribution of patients

| Age group | Boys | Girls | P value |
|---|---|---|---|
| <1 year | 10 | 6 | 0.2 |
| 1-2 years | 13 | 7 | 0.1 |
| 2-5 years | 43 | 54 | 1 |
| 5-10 years | 57 | 80 | 0.3 |
| >10 years | 33 | 23 | 0.1 |
| Total | 156 | 170 | |

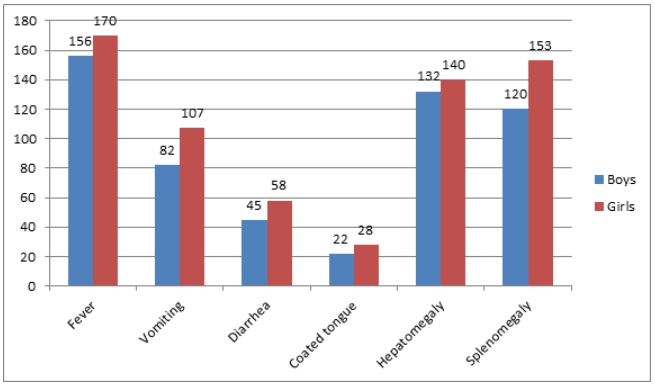


**Fig 1:** Symptoms seen in patients

**Table 3:** Comparison of symptoms with other studies

| Symptoms | Our study | Sinha *et al.* | Walia *et al.* | Siddiqui *et al.* |
|---|---|---|---|---|
| Fever | + | + | + | + |
| Vomiting | + | + | + | + |
| Diarhea | + | + | + | + |
| Coated tongue | + | - | + | + |
| Hepatomegaly | - | - | - | - |
| Splenomegaly | + | + | + | + |

## Discussion

Typhoid is common among childrens. A typhoid vaccine can prevent about 30% to 70% of cases during the first two years. The vaccine may have some effect for up to seven years. It is recommended for those at high risk or people traveling to areas where the disease is common [5]. Other efforts to prevent the disease include providing clean drinking water, better sanitation, and better handwashing. Until it has been confirmed that an individual's infection is cleared, the individual should not prepare food for others. Treatment of disease is with antibiotics such as azithromycin, fluoroquinolones or third generation cephalosporins. Resistance to these antibiotics has been developing, which has made treatment of the disease more difficult [5].

This study was conducted in the department of pediatrics from year 2010- 2015. It included 326 children who diagnosed with typhoid fever if presented with fever (temperature >38°C) for atleast 3 days and their blood culture yielded S. typhi.

We found that out of 326 patients, 156 were boys and 170 were girls. A study conducted by Khosla *et al* [6] reported 120 boys and 142 girls in their study.

We also analyzed age wise distribution of patients and found that patients <1year were 10 boys and 6 girls. 1-2 years had 13 boys and 7 girls. 2-5 years had 43 boys and 54 girls. 5-10 years had 57 boys and 80 girls. >10 years had 33 boys and 23 girls. Maximum number of patients was seen in age group 5-10 years. This is in accordance to Pandey *et al*., [7].

We found that common symptoms were fever, vomiting, diarrhea, coated tongue, hepatomegaly and splenomegaly. Similar findings were seen study by Parry CM *et al*. We compared symptoms of our study with study by Sinha *et al*., [8], Walia *et al*., [9] and Sididiqui *et al*., [10], all symptoms were seen which were also seen in our study except coated tongue which was absent in other studies.

The bacterium that causes typhoid fever may be spread through poor hygiene habits and public sanitation conditions, and sometimes also by flying insects feeding on feces. Public education campaigns encouraging people to wash their hands after defecating and before handling food are an important component in controlling spread of the disease.

Sanitation and hygiene are important to prevent typhoid. Typhoid does not affect animals other than humans. Typhoid can only spread in environments where human feces are able to come into contact with food or drinking water [11]. Careful food preparation and washing of hands are crucial to prevent typhoid. Industrialization, and in particular, the invention of the automobile, contributed greatly to the elimination of typhoid fever, as it eliminated the public health hazards associated with having horse manure in the public street which led to large number of flies.

## Conclusion

Typhoid fever is common among children. Proper sanitation and hygeine are important to prevent typhoid. Careful food preparation and washing of hands are crucial to prevent typhoid.

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