

Clinical Spectrum Of Enteric Fever In A Tertiary Care Centre In Bangalore, India

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ABSTRACT:- Enteric fever is public health problem in India with a high prevalence of 493/1,00,000 cases. Enteric fever presents as clinical dilemma as its clinical signs and symptoms are similar to other infectious diseases. Lack of routine immunization and unhygienic practices might be responsible for its high prevalence. In this study we aim to study the clinical profile of enteric fever. This was a prospective observational study conducted in a tertiary care hospital in Bangalore India over a period of 10 months. 80 Widal positive cases were studied for clinical picture, therapeutic response and complications. In our study it was found that 58% were males and 42% were females. Maximum number of cases (45%) were between 6-10 years followed by children more than 10 years (42.5%). Major symptoms were fever(100%) ,generalized fatiguability(70%) and abdomen pain (54%). 72.5% of the cases had relative bradycardia, 61% had hepatomegaly, 46% had pallor, 43% had abdomen tenderness 22.5%. Most of the cases responded to a single antibiotic. Leucopenia and eosinopenia were more common. This study shows the clinical picture of enteric fever. Including vaccination and public health measures could reduce the burden of the disease.

Keywords – Children, Enteric fever, Salmonella, Typhoid, Widal.

I. INTRODUCTION

Enteric fever is caused by Salmonella typhi, Salmonella paratyphi and Salmonella choleraesuis. South east Asian countries are said to have a high incidence of >100/100,000 cases of enteric fever/year [1]. The World Health Organization recommends the use of typhoid conjugate vaccines to prevent infection in high-risk populations like India [2], but typhoid vaccine is not a part of the routine national immunization programme in our country.

The prevalence of enteric fever in India was around 493/1,00,000 person years according to a study conducted by Ochiai et al in 2008 [3]. The illness is common in parts of the world where there is contaminated water supply and sanitation. Enteric fever presents as a clinical dilemma as the clinical signs and symptoms are similar to other infectious disease. Enteric fever can present differently in different age groups like, a completely afebrile course in sick children, a high spiking fever from the first day, a focal presentation (e.g., pneumonia and nephritis) [4].

Lack of appropriate antibiotic therapy for the appropriate duration can result in serious complications which can occur in 10-15% and relapse which can occur in 5-10% [5].

The laboratory diagnosis of choice for enteric fever depends on the duration of fever. It can be detected from blood, bone marrow, bile, urine or specific anatomic lesions. Blood culture is the gold standard and has a specificity of 100% and has maximum yield in 1st week (90%) [6]. WIDAL test has a sensitivity of 47-77% and a specificity of 50-92%, and should be done only after one week of fever [7]. WIDAL is most commonly used due to easy availability, relatively cheaper and easier to perform. In our study we included patients with fever more than 7 days and had a positive WIDAL test.

The aim of this study was to study the clinical spectrum of enteric fever in a tertiary care hospital in Bangalore, India.

II. MATERIALS AND METHODS

This was a prospective observational study conducted in Kempegowda institute of medical sciences, Bangalore, Karnataka. The duration of the study was from January to October 2019. The number of children included in the study were 80.

INCLUSION CRITERIA:

- Children of age 1year -18 years who presented with fever of 7 days or more with clinical signs and symptoms suggestive of typhoid fever and positive Widal test (1:160 and above)

EXCLUSION CRITERIA:

- Other sources of infection like respiratory, nervous system, cardiac, genitourinary system.
- Immunocompromised patients.

The study was approved by the institutional ethical committee Informed written consent was taken from the parents/guardian. Data regarding symptoms, signs, Laboratory investigations, treatment were taken from the case record form.

The definitions used in this study were:

1. Leucopenia: Total WBC count < 4000 cells/mm³
2. Leucocytosis: Total WBC count > 10,000 cells/mm³
3. Eosinopenia: Absence of eosinophils in the peripheral smear.

Statistical analysis was done using stata version 4. The two-sample t test was used for comparing continuous variables and the chi square test for categorical variables.

III. RESULTS

Of the 80 cases of enteric fever admitted during the study period, 58% were males and 42% were females .

TABLE 1: Gender distribution of cases

GENDER	NUMBER (n=80)	PERCENTAGE
Male	46	58%
Female	34	42%

TABLE 2: Age distribution of the cases

AGE (years)	NUMBER (n=80)	PERCENTAGE
1-5	10	12.5%
6-10	36	45%
>10	34	42.5%

Table 2 shows the age distribution of the cases with enteric fever. Maximum number of cases(45%) were between 6-10 years followed by children more than 10 years (42.5%).

TABLE 3: Distribution of symptoms

SYMPTOMS	NUMBER (n=80)	PERCENTAGE
Fever	80	100%
Generalised fatiguability	56	70%
Abdomen pain	43	54%
Loose stools	28	35%
Headache	22	28%
Cough	8	10%
Constipation	12	1.5%

Table 3 shows the distribution of symptoms in the cases. Major symptoms were fever(100%) and generalized fatiguability(70%) .Abdomen pain was present in 54%,loose stools in 35%,headache in 28%,cough in 10% and constipation in 1.5%.

TABLE 4 : Distribution of signs

SIGNS	NUMBER (n=80)	PERCENTAGE
Pallor	37	46%
Hepatomegaly	49	61.2%
Splenomegaly	18	22.5%
Relative bradycardia	58	72.5%
Abdomen tenderness	35	43.7%
Coated tongue	12	15%

Table 4 shows that 72.5% of the cases had relative bradycardia, 61% had hepatomegaly, 46% had pallor, 43% had abdomen tenderness, 22.5% had splenomegaly and 15% had coated tongue. Rose spot was not present in any of the cases. None of the cases had complications like hepatitis, perforation, bleeding or other complications. The average duration of fever in our cases was 10.4 days.

TABLE 5: Results of Widal test titer.

WIDAL TITER	NUMBER (n=80)	PERCENTAGE
1:160	44	55%
1:320	36	45%

55% had a WIDAL titer of 1:160 and 45% had a titer of 1:320.

TABLE 6: Antibiotics requirement

ANTIBIOTICS	NUMBER (n=80)	PERCENTAGE
SINGLE	58	72.5%
COMBINATION	22	27.5%

Table 6 shows the need for antibiotic therapy in the cases. 72.5% of the cases needed only one antibiotic for successful treatment. The most commonly used antibiotic was Ceftriaxone. 27.5% of the cases needed an add-on antibiotic, most commonly ofloxacin.

TABLE 7: Distribution of laboratory findings

LABORATORY FINDING	NUMBER (n=80)	PERCENTAGE
Leucocytosis (>11,000/mm³)	10	12.5%
Leukopenia (<4,000/mm³)	26	32.5%
Eosinopenia	37	46.25%

Table 7 shows that more children have leukopenia (32.5%) as compared to leukocytosis (12.5%). Eosinopenia was seen in 46.25% cases.

IV. DISCUSSION

Typhoid fever continues to be a major public health problem in developing South East Asian countries like India. This study aimed to study the detailed clinical picture of children aged 1 to 18 years. The number of males in this study was 58%, which was more than females. These similar results were noted in other similar studies like those done by Jog et al and Gopal Singh et al [8],[9].

The maximum percentage of cases were between 5-10 years in our study. This observation could be due to the higher chance of children of school-going age groups to drink unclean water and contaminated food by eating outside. This is similar to studies done by Modi et al where 45% were between 2-7 years [10].

The most common presenting symptom was fever followed by generalized fatigability and abdominal pain. This was similar to other studies by Kapoor et al and Sinha et al [11],[12]. The most common sign was relative bradycardia which is bradycardia inappropriate to the rise in temperature, this was seen in 72.5% of the cases. According to a study by Ostergaard et al relative bradycardia was found to be a statistically significant sign in 3 diseases and typhoid fever is one among them [13].

Leukopenia was more common than leukocytosis. In adults, leukopenia is more common, however, children can have leukocytosis more than leukopenia. *Salmonella* being an intracellular organism in the macrophages and by causing bone marrow suppression might lead to leukopenia. Eosinopenia is a well-known laboratory parameter in enteric fever [14].

Since our study included children with fever more than 7 days, the preferred investigation was WIDAL test and blood culture and sensitivity was not done. Most of the patients responded to ceftriaxone (72%) and some needed an add-on with a second drug, preferably a fluoroquinolone.

The mean time taken for fever to stop after in our cases was 5.5 days, which was similar to a study done by Olsen et al which showed a duration of 6.1 days [15].

V. CONCLUSION

Enteric fever continues to be a public health problem with emerging drug resistance. Enteric fever can be prevented by adding typhoid conjugate vaccines as a part of the routine immunization for children as recommended by the WHO and Indian Academy of Pediatrics advisory committee on vaccination and

immunization practices. Public education regarding hygienic practices like thorough handwashing before eating and preparing/handling foods, and sanitary disposal, clean drinking water should be re-emphasized.

REFERENCES

- [1]. Crump JA, Luby SP, Mintz ED. The global burden of typhoid fever. *Bull World Health Organ.* 2004;82(5):346–353.
- [2]. WHO. Typhoid vaccines: WHO position paper, March 2018 - Recommendations. *Vaccine.* 2019
- [3]. JOchiai, R. L., Acosta, C. J., Danovaro-Holliday, M. C., Baiqing, D., Bhattacharya, S. K., Agtini, M. D., Domi Typhoid Study Group (2008). A study of typhoid fever in five Asian countries: disease burden and implications for controls. *Bulletin of the World Health Organization*, 86(4), 260–268.
- [4]. Rajajee S, Anandi TB, Subha S, et al. Patterns of resistant *Salmonella typhi* infection in infants. *J Trop Pediatr* 1995;41:52–4.
- [5]. Ahmad KA, Khan LH, Roshan B, et al. Factors associated with typhoid relapse in the era of multiple drug resistant strains. *J Infect Dev Countries* 2011;5:727–31.
- [6]. Rajesh Upadhyay, Milind Y Nadkr, A Muruganathan. API recommendations for the management of Typhoid fever. *Journal of the association of physicians of India* 2015;3:77-96.
- [7]. Bhutta ZA, Dewraj HL. Current concepts in the diagnosis and treatment of typhoid fever. *BMJ* 2006;333:78-82.
- [8]. Jog S, Soman R, Singhal T, Rodrigues C, Mehta A, Dastur FD. Enteric fever in Mumbai—clinical profile, sensitivity patterns and response to antimicrobials. *JAPI.* 2008;56:237-40
- [9]. K. Gopal Singh¹, J. Syam Sundar. A study on clinical profile of typhoid fever at Government General Hospital, Nizamabad, Telangana, India. *Int J Contemp Pediatr.* 2019 Nov;6(6):2642-2645
- [10]. Modi R. Clinical profile and treatment outcome of typhoid fever in children at a teaching hospital, Ahmedabad, Gujarat, India. *Int J Medi Sci Public Health.* 2016 Feb 1;5(2):212
- [11]. Kapoor JP, Mohan M, Talwar V, Daral TS, Bhargava SK. Typhoid fever in young children. *Indian Pediatr.* 1985 Nov;22(11):811-3.
- [12]. Sinha A, Sazawal S, Kumar R, Sood S, Reddaiah VP, Singh B, et al. Typhoid fever in children aged less than 5 years. *Lancet.* 1999 Aug 28;354(9180):734-7. 20.
- [13]. Ostergaard L, Huniche B, Anderson PL. Relative bradycardia in infectious diseases. *J Infect.* 1996. Nov ;33(33):185-91.
- [14]. Carl Britto, Andrew J Polland, Merryn Voysey et al. An appraisal of the clinical features of pediatric Enteric fever: systematic review and meta analysis. *Clinical infectious diseases* 2017 June ;64(11):1604-1611.
- [15]. Olsen SJ, Pruckler J, Bibb W, Nguyen TM, Tran MT, Sivapalasingam S, et al. Evaluation of rapid diagnostic tests for typhoid fever. *J Clin Microbiol.* 2004;42:1885-9.

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