Original Research Article

Clinical spectrum of enteric fever in children admitted to a tertiary care hospital

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ABSTRACT

Background: Enteric fever is a common public health problem with variable clinical presentation. The aim of study was to study the clinical spectrum of enteric fever in children.

Methods: This was a prospective study conducted over period of one year from January 2019 to January 2020 in the Department of Paediatrics at Govt Medical College Srinagar. It included all patients in the age group of 1-18 years who were clinically suspected to have enteric fever and had either a positive blood culture for *Salmonella* or a positive Widal test.

Results: This study included total of 76 patients out of which 36 were males and 40 were females. The most common presenting symptoms were fever anorexia, vomiting, diarrhoea, abdominal pain, headache and constipation. The most common signs were coated tongue, toxic look, hepatomegaly, splenomegaly, pallor, jaundice and abdominal distension. Complications were seen in 8 (10.5%) patients. Myocarditis was seen in 3 patients. Encephalopathy and hepatitis was seen in 2 patients each. Pneumonia was seen in 1 patient. Majority of patients had normal white blood cell count (4000-11000/cumm). Leukopenia (<4000/cumm) was seen in 10% patients and leukocytosis (>11000/cumm) was seen in 15% patients. Thrombocytopenia was seen in 9% patients. Blood culture was positive in 36 (47.36%) patients. *Salmonella typhi* was seen in 33 patients whereas *Salmonella paratyphi A* was seen in 3 patients. All culture positive cases were sensitive to ceftriaxone, cefixime and azithromycin. Ciprofloxacin resistance was seen in 11 (14.4%) patients.

Conclusions: Enteric fever is a common public health problem with fever as most common presenting symptom. Culture yield can be increased in enteric fever by drawing blood culture prior to administration of antibiotics. Ceftriaxone is highly efficacious as monotherapy in enteric fever.

Keywords: Children, Clinical spectrum, Enteric fever

INTRODUCTION

Enteric fever remains endemic in many developing countries. Enteric fever is caused by *S. Enterica Serovar Typhi* (*S. Typhi*), a Gram negative bacterium. A very similar but often less-severe disease is caused by *Salmonella Paratyphi A* and rarely by *S. Paratyphi B* and *S. Paratyphi C*. It is estimated that more than 26.9 million typhoid fever cases occur annually, of which 1% result in

death. The vast majority of this disease burden is witnessed in Asia. The incubation period of typhoid fever is usually 7-14 days but depends on the infecting dose and ranges between 3 and 30 days. The clinical presentation varies from a mild illness with low-grade fever, malaise, and slight, dry cough to a severe clinical picture with abdominal discomfort and multiple complications. Typhoid fever usually manifests as high-grade fever with a wide variety of associated features,

such as generalized myalgia, abdominal pain, hepatosplenomegaly, abdominal pain, and anorexia. In children, diarrhea may occur in the earlier stages of the illness and may be followed by constipation. The presentation of typhoid may be more dramatic in children younger than 5 yr of age, with comparatively higher rates of complications and hospitalization. Diarrhea, toxicity, and complications such as disseminated intravascular coagulopathy are also more common in infancy, resulting in higher case fatality rates. If no complications occur, the symptoms and physical findings gradually resolve within 2-4 weeks.¹ Objective was to study the clinical spectrum of enteric fever in children admitted to the hospital.

METHODS

It was a hospital based prospective study conducted over a period of one year from January 2019 to January 2020 in department of pediatrics, Government Medical College Srinagar J&K.

Inclusion criteria

All the patients in the age group of 1 to 18 years with clinically suspected enteric fever and either Widal or Blood culture was positive were included in this study.

Exclusion criteria

- Age less than one year or more than 18 years.
- Patients who had received antibiotics prior to admission.
- Patients with co morbid conditions.

All patients were subjected to detailed history and examination. Baseline investigations were done in all patients. In addition to baseline investigation blood culture and Widal test was done in all patients. Blood culture was done after taking proper aseptic precautions. Blood culture was done by BACTEC Automated Blood Culture Analyser for at least 48 hours. Widal was done by tube agglutination test. A titre of $\geq 1:160$ to either O or H antigen in a single serum specimen was taken as indicator of typhoid fever.

RESULTS

This study included 76 patients out of which 36 were males and 40 were females. Majority of patients were in the age group of 5-10 years. The age distribution of study population is depicted in Table 1.

Table 1: Age distribution.

Age group	No. of patients	Percentage
1 - 5 Year	10	13%
5 - 10 Year	36	47%
10 - 18 Year	30	40%

The most common presenting symptom in our study was fever (100%) which was seen in all patients followed by anorexia (97.3%), vomiting (30%), diarrhoea (31.5%) and abdominal pain (18.4%). Least common presenting symptoms were headache (13%) and constipation (13%) as depicted in Table 2.

Table 2: Symptoms.

Presenting symptoms	No. of patients	Percentage
Fever	76	100%
Anorexia	74	97.3%
Vomiting	30	39%
Diarrhoea	24	31.5%
Abdominal pain	14	18.4%
Headache	10	13%
Constipation	10	13%

The most common physical finding was coated tongue (67%) followed by toxic look (56.5%) hepatomegaly (36.8%), splenomegaly (32.8%) and pallor (32.8%). Least common findings were jaundice (2.7%) and abdominal distension (1.3%) as depicted in Table 3.

Table 3: Signs.

Physical findings	No. of patients	Percentage
Coated tongue	51	67%
Toxic look	43	56.5%
Hepatomegaly	28	36.8%
Splenomegaly	25	32.8%
Pallor	25	32.8%
Jaundice	2	2.7%
Abdominal distension	1	1.3%

Complications were present in eight patients (10.5%). Myocarditis was present in three patients (3.9%), encephalopathy and hepatitis in two patients each (2.6%) and pneumonia was seen in one patient (1.35%) as shown in Table 4.

Table 4: Complications.

Complication	No. of patients	Percentage
Myocarditis	3	3.9%
Hepatitis	2	2.6%
Encephalopathy	2	2.6%
Pneumonia	1	1.35%

The mean white blood cell (WBC) count was 8350 /cumm with a range of 2800 /cumm to 20000/cumm. Seventy three percent patients had WBC count within normal range (4000-11000/cumm). Leukopenia (<4000 /cumm) was seen in ten percent patients. Leukocytosis (>11000 /cumm) was seen in fifteen percent patients. The mean platelet count was 2,33000/cumm with a range of 79000/cumm to 3,67000/cumm.

Thrombocytopenia (1.5 lacs/cumm) was seen in 7 (9.2%) patients. Blood culture was positive in 36 patients (47.36%). Blood culture revealed *Salmonella typhi* in 33(43.4%) patients and *Salmonella paratyphi* A in 3 patients (3.9%). Widal test was positive in all patients. All 36 culture positive patients were sensitive to ceftriaxone, cefixime and azithromycin, 100% resistance was seen to amoxycylav, amoxicillin and nalidixic acid. Ciprofloxacin resistance was seen in 11 (14.4%) patients. The mean time to defervescence defined as time period in days from the day of onset of antibiotic therapy in the hospital to the disappearance of fever was 5.9 days. In this study 7 (13%) patients continued to remain febrile even after 7 days of ceftriaxone therapy. Blood culture was negative in these patients. These patients were put on combination of ceftriaxone and azithromycin and all these patients became afebrile within 3 days of onset of combination.

DISCUSSION

This study was a prospective study conducted at department of pediatrics, Government Medical College Srinagar over a period of one year from January 2019 to January 2020. Majority of patients in our study were in age group of more than 5 years which is comparable to study done by Sudhindra BK et al.² Fever was seen in all (100%) patients. Similar results were seen in studies done by Kundu R et al, Ganesh R et al, Walia M et al, and S Jog et al.³⁻⁶ Anorexia was seen in 74 patients (97.3%) which is similar to study done by Md Salim et al.⁷ Vomiting was seen in 30 (39%) patients which is similar to study done by S Jog et al.⁶ Diarrhoea was seen in 24 cases (31.5%) which is comparable to study done by Ganesh et al, and S Jog et al.^{4,6} Abdominal pain was seen in 14 cases (18.4%) which is similar to study done by Chowta MN et al, and S Jog et al.^{6,8} Headache was seen in 10 cases (13%) which is comparable to study done by Md. Salim et al.⁷ Constipation was seen in 10 cases (13%) which is comparable to studies done by Comeau et al and Taneja PN et al.^{9,10}

In this study coated tongue and toxic look were the most clinical findings. Coated tongue was seen in 51 patients (67%) similar to studies done by R Modi and Iqbal et al.^{11,12} Toxic look was seen in 43 cases (56%) similar to study done by Sood and Taneja.¹³ Pallor was seen in 25 patients (32.8%) which is comparable to study done by Malik and Malik.¹⁴ Hepatomeagly was seen in 28 cases (36.8%) which is similar to studies done by R Modi Chowta MN et al and Jeeyani H et al.^{8,11,15} Splenomeagly was seen in 25 patients (32.8%) similar to studies done by S Jog et al and Jeeyani H et al.^{6,15}

Complications were seen in 8 patients (10.5%) which is similar to study done by Jeeyani H et al.¹⁵ Myocarditis was seen in 3 cases (3.9%) and hepatitis in 2 cases (2.6%) similar to study done by Jeeyani et al.¹⁵ Encephalopathy was seen in 2 cases (2.6%) similar to study done by Md. Salim et al.⁷ The mean time to defervescence was 5.9

days which is similar to studies done by S Jog et al and Parry et al.^{6,16}

CBC (complete Blood Count) revealed leukopenia in 8 patients (10.5%) and leukocytosis in 12 patients (15.8%). In rest 56 patients (73.6%) CBC was normal. Similar results were reported by Modi R.¹¹ Platelet count was normal in majority of patients. Thrombocytopenia was seen in 7 (9.2%) patients similar to study by Jeeyani H et al.¹⁵ Blood culture was positive in 36 patients (47.36%) which is similar to study done by Jeeyani H et al.¹⁵ In study by Modi R.¹¹ Blood culture was positive in 7% only.

The relatively higher percentage of culture positivity could be attributed to the fact that blood culture was drawn prior to administration of antibiotics and patients with prior history of antibiotic intake were excluded from study. All culture positive cases were sensitive to ceftriaxone similar to study done by Salim M et al.⁷ All culture positive cases were sensitive to azithromycin as well. Similar results were reported by Khanam F et al.¹⁷ 100% resistance was seen to amoxycylav, amoxicillin and nalidixic acid similar to study by Salim M et al.⁷ Ciprofloxacin resistance was seen in 11 (14.5%) patients similar to study by Salim M et al.

CONCLUSION

Enteric is a very common public health problem with fever as major presenting symptom. Blood culture yield can be increased by drawing sample prior to administration of antibiotics. Majority of cases have uncomplicated course. Ceftriaxone is highly efficacious drug against enteric fever.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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