

Clinical profile of Enteric fever in children at Bharati Hospital, Sangli.



Pediatrics

KEYWORDS: Typhoid, Blood culture, Salmonella Typhi, Widal test.

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ABSTRACT

Aims: To study the clinical profile of patients with enteric Fever admitted at Pediatric ward in Bharati Hospital, Sangli

Materials and methods: This was a cross sectional study carried out at Bharati Vidyapeeth Medical College and Hospital, Sangli. The study period was from 2nd May 2014 to 2nd May 2016. A total of 35 patients enrolled for this study.

Results: A total of 49 patients were suspected of enteric fever from which, 35 were enrolled on basis of raised widal titre or positive blood culture. The age range was 6 months to 16 years. Out of 35 patients, 21 were males and 14 were females. Blood culture was positive in 14 patients. Commonest symptom was fever which was seen in all cases, followed by abdominal pain-8, vomiting-4, headache and cough-3, loose motions-1. Splenomegaly was the commonest sign-35, followed by hepatomegaly-7, followed by coated tongue-4 and relative bradycardia-3. Ceftriaxone was the commonest antibiotic used-35. Complications were seen in 2 patients- splenic abscess and developed sepsis and GI hemorrhage.

Conclusion: Blood culture was positive in 40 % patients in our study. Most patients responded to Ceftriaxone. Complications were seen in 2 patients.

Introduction:

Enteric fever is a systemic infection caused by *Salmonella* Enterica serotype typhi or paratyphi A or B. It occurs in all parts of the world where water supplies and sanitation are substandard. Enteric fever is an endemic in India. Reported data for the year 2009 shows 1.03 million cases and 421 deaths occurred due to enteric fever¹.

Clinical as well as laboratory diagnosis of enteric fever presents problems. Symptoms and signs of enteric fever resemble other febrile illnesses. Blood culture is considered to be the "gold standard" for diagnosis as not only it identifies the organism but also gives its antibiotic sensitivity. However, lack of awareness among health care Professionals, use of empirical antibiotics, lack of facility for blood culture, as well as cost factor has led to decreased use of this investigation technique for diagnostic purpose. The Widal test as a diagnostic modality has suboptimal sensitivity and specificity and also requires careful interpretation^{2,3}.

The disease is endemic in India and carries a significant morbidity and mortality in both paediatric and adult population. Reliable data from which to estimate the burden of disease in these areas is difficult to obtain. Many hospitals lack facilities for blood culture and upto 90% of patients with fever are treated as outpatients. In Asia, the disease burden estimates have normally relied on clinical diagnosed cases of typhoid fever compiled by governments and hospitals, usually with uncertain denominators⁴.

The real concern is that the gold standards technique of culture isolation of *Salmonella* typhi (S. Typhi) provides a definitive diagnosis in 73- 97 % cases prior to medications, excessive antibiotic use has reduced this isolation rate to 40-60%⁵.

Very few studies have been done from western Maharashtra on enteric fever to study clinical profile and complications, so this study was undertaken.

Literature survey:

Typhoid Fever is a noted cause of morbidity worldwide with an estimated 21.7 million cases, the bulk of the burden being borne by India, South and Central America and subSaharan Africa, all with

growing population and poor sanitary conditions^{6,7}. There is dearth of available epidemiological data to project the actual situation in India, though a few hospital and large population studies have demonstrated substantial changes in the incidence of typhoid fever^{8,9,10}. The burden of typhoid fever is thus heavy. It is necessary to gather as much information as possible on this disease so as to devise proper strategies to counter it. If the disease is not controlled, the estimated burden will be even heavier and in due course of time it will be more and more difficult to deal with it.

Materials and Methods:

This was a prospective study carried out in Bharati Vidyapeeth Deemed University Medical College & Hospital, Sangli. All children whose parents or legal guardians gave consent were included in the study which was carried out from 2nd May 2014 to 2nd May 2016. In this study all the patients with suspected enteric fever that is, fever for more than 8 days were admitted in the pediatric ward. Detailed history regarding fever, abdominal pain, vomiting was taken. After detailed general examination and systemic examination, clinical diagnosis of enteric fever was done. These patients were subjected to investigations like CBC, Urine routine and microscopy, Blood culture and sensitivity and tube agglutination widal test. The result of widal test was available after 36 to 48 hours. In this study, all patients having widal titre (level of both H and O anti-bodies of 1 in 160 dilution or more by tube method) were enrolled in this study. Others who were clinically diagnosed as enteric fever but had less than significant titre or negative widal test and negative blood culture were excluded from this study. A total of 35 patients were included in the study. Other investigations like USG abdomen, X-Ray chest, CSF examination was done depending upon the complications suspected. Once diagnosed as enteric fever, patients were started on Inj. Ceftriaxone 100 mg/kg single dose daily IV. Once the blood culture report was available, antibiotic policy was modified as per culture and sensitivity report. The clinical course of the patient was studied in detail in the ward. Patients were shifted on oral antibiotics after 72 to 96 hours of afebrile phase. All relevant data was filled up into Microsoft Excel. The analysis was done with the help of MS Excel¹.

Results

A total of 49 patients were admitted with clinically suspected enteric

fever from 2nd May 2014 to 2nd may 2016. Out of these 35 were diagnosed as enteric fever either by positive blood culture or widal test with significant titre(1:160 and above) were included in the study. The age range was 6 months to 16 years.

Out of the 35 patients included in the study, 21(60%) were males and 14(40%) were females.

Table showing Age group of Enteric Fever patients:

AGE	Frequency
< 1 years	1
1-5 years	10
6-10 years	11
11-15 years	11
16-20 years	2

Out of the 35 patients, 1 (2.85%) was less than 1 year of age. 10 (28.57%) were between 1-5 years of age, 11(31.42%) were between 6-10 years of age, 11(31.42%) were between 11-15 years and 2(5.71%) were between 16-20 years of age.

Out of the 35 patients on whom blood culture and sensitivity was done, 21 (60%) were sterile and 14 (40%) were positive.

Out of the 35 patients, all 35(100%) had fever for more than 8 days, followed by abdominal pain 8(22.85%), followed by vomiting 4(11.42%), followed by headache and cough – 3(8.57%). 1(2.85%) patient whose age was less than 1 year, presented with loose motions and another patient had erythematous maculopapular rash. 3 patients presented with bronchopneumonia with symptoms of cough, fever and breathlessness.

Of the signs observed, 35(100%) had splenomegaly, 7 (20%) had hepatomegaly 4(11.42%) had coated tongue and 3(8.57%) patients had relative bradycardia.

Table showing signs and symptoms of enteric fever:-

Symptoms	Number of patients
Fever	35
Abdominal pain	8
Vomiting	4
Headache	3
Cough	3
Loose motions	1
Signs	Number of patients
Splenomegaly	35
Hepatomegaly	7
Coated tongue	4
Relative bradycardia	3

Of all the drugs used, 35(100%) were started on ceftriaxone. Inj. Amikacin was added in 8 (22.85%) patients who didn't respond to ceftriaxone alone. In 1 patient, IV ofloxacin was added as per culture and sensitivity report and meropenem was added in 1 patient who developed sepsis and not responded to ceftriaxone.

Complications were seen in 2 patients in the form of splenic abscess in 1 patient and sepsis with GI bleed in other patient. Both the patients responded to medical line of management. Splenic abscess patient responded to IV antibiotics and repeated USG guided aspirations.

Discussion

Salmonella typhi remains a major problem in developing countries. Enteric fever was found to be a common cause of fever persisting more than 5 days. Studies report that typhoid fever is endemic in south East Asia and Indian subcontinent. However, measuring the incidence of febrile illness caused by various pathogens poses a major health challenge because hospital based approaches capture only a fraction of patients, clinical diagnosis is usually unreliable and diagnostic tests are often not available in disease-endemic

countries^{11,12}.

Blood culture is the gold standard for diagnosis and also gives information about antibiotic sensitivity of the isolate. In our study, blood culture was found to be positive in 14(40%) and sterile in 21(60%) of the patients. Culture positivity in a study by Ganesh Shah et al was found to be 11.09%. 87% of the isolates were Salmonella Typhi while 13% were Salmonella Paratyphi A¹³. Whereas culture positivity was 52.6% and 61% of the isolates were Salmonella Typhi while 39% were Salmonella Paratyphi reported by jog et al¹⁴.

Culture positivity was 50% out of which 82.7% were caused by Salmonella Typhi and 17.3% were caused by Salmonella Paratyphi A in a study by Chandrashekar et al¹⁵. Major reason for low blood culture positive in our study was most patients were referred from periphery who had received oral antibiotics on OPD basis.

In this study, out of the total 35 patients in this study, 21(60%) were males and 14(40%) were females. In a study by Gansesh Shah et al¹⁵, it was found that 54% of all the cases were males and 46% were females. Females were 52.3% and males were 47.7% in a study by chowta et al¹⁶. In our study it was observed that there were 11 patients each in the 6-10 and 11-15 years age group comprising of 31.43% of all the patients. In a study by Chandrashekar et al¹⁵, it was found that most of the patients were more than 5 years. Also in a study by siddiqui et al¹⁷, it was found that there was a higher incidence of enteric fever in the 10-15 years age group. This is consistent with other settings, which show age specific attack rates reaching a peak between 5 and 12 years. A higher peak incidence in the 11-15 years group may be a marker of past infection. It is already known that following acute infections, patients may continue to excrete typhoid bacilli for several weeks to years.

In our study, it was found that the most common presenting complaint was fever which was seen in all 35(100%) of all the patients. It was followed by abdominal pain, which was seen in 8(22.85%) cases, followed by vomiting-4(11.42%). It was followed by 3(5.7%) each of headache and 1(2.85%) each of rash and loose stools. Bronchopneumonia presentation was seen in 3(8.57%) patients in our study. Fever, vomiting, abdominal pain, diarrhea and cough were the most common clinical manifestations of enteric fever in children seen in a study by Ganesh et al¹³ similar to that reported by Patankar et al²⁰. In that study, headache was found in 10.08% probably because younger children do not complain of headache. Fever, diarrhea, abdominal pain and constipation were present in 100%, 20.4%, 20.4%, 11.3% and 9.09% patients respectively in a study by chowta et al¹⁶. Although diarrhea is a common finding of typhoid fever, it is not regarded as a diagnostically useful clinical criterion. The incidence of diarrhea in children with culture proven typhoid fever was 78 % in one series in Australia and 50% in a report in Vietnam¹⁸.

All 35(100%) patients had splenomegaly. Coated tongue was found in 4(11.42%), 3(8.57%) had hepatosplenomegaly whereas 1(2.85%) had hepatomegaly. In a study by Ganesh et al¹³, hepatomegaly was seen in 34.45% cases and splenomegaly was observed in 21% cases. In a study by patankar et al²⁰, hepatomegaly was found in 81.8% of the cases and splenomegaly in 48.5%. In a study by KC et al, splenomegaly was seen in 36% cases and hepatomegaly was seen in 17% cases²¹.

Out of all the cases, 20(57.14%) were sensitive to ceftriaxone, 8(22.85%) were sensitive to amikacin, 7(20%) were sensitive to cefotaxime, 2(5.71%) were sensitive to ciprofloxacin and Ofloxacin each. 1(2.85%) each were sensitive to Tobramycin and Ampicillin each. Also 1(2.85%) each required Piperacillin+Tazobactam and Meropenem. In the study by Ganesh et al¹³, Ceftriaxone was sensitive in 41%, Ofloxacin in 19.3%. In a study by S Jog et al¹⁴, sensitivity was seen to Chloramphenicol, Ampicillin and Cotrimoxazole. Also sensitivity was seen to third generation cephalosporins as in other studies by Chowta et al¹⁶, Safdar et al²². Chande et al²³ observed resistance to Cefotaxime in 1 isolate in their study from central India. 2 patients developed complications. Out of which 1(2.85%) patient

developed splenic abscess who responded to repeated USG guided aspiration and antibiotics. 1(2.85%) another patient who presented with sepsis and GI bleed who responded with Inj. Meropenem and conservative treatment. In a study by Ganesh et al¹³, 26% of the patients developed complications where as 10 to 15 percent patients developed complications in a study by KC et al²¹. Some of the serious complications like encephalopathy, meningitis, pneumonia/effusion, septic shock, myocarditis and common complications like hepatitis were observed which were consistent with study done by Raghu Raman et al. Typhoid encephalopathy (12.8%), hepatitis (5.1%), bronchopneumonia (5.1%) and pleural effusion (2.6%) were some serious complications observed by Mishra et al²⁴.

The average duration required for positive response after starting antibiotics was around 4 days. Most of the patients required Injectable antibiotics for 10 days. There was no mortality in our study.

Conclusion:

Blood culture was positive in 40 % patients in our study. Most patients responded to third generation cephalosporin injection in the form of Ceftriaxone. One patient needed Meropenem, which did not respond to Ceftriaxone. Ofloxacin was used for 1 patient. Systemic complications though rare were seen in 2 patients in our study.

Future scope:

This study included the clinical profile of patients admitted with enteric fever. The salmonella species is finding more and more ways to acquire drug resistance as a result of which, some drugs which were very effective earlier against them are not so now. These include drugs like quinolones, hence beta lactams are increasingly used. There is change in the overall management of the disease. the cases that were included in this study were not followed up, hence it was not possible to determine whether there was a relapse of enteric fever in these cases or not. Also sample size was considerably small. A larger population needs to be included in this study to have a better overall view of the clinical scenario, especially about the impact of the disease in the younger age group. Blood culture reports in our study were found to be only positive in 14(40%) of the cases. This can largely be attributed to empirical use of antibiotics by practitioners before referral of the cases, hence the true culture and sensitivity profile of all patients could not be effectively obtained.

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