



ORIGINAL RESEARCH PAPER

Pediatrics

STUDY OF THE CLINICAL PROFILE OF ENTERIC FEVER AND ITS OUTCOME IN PEDIATRIC AGE GROUP.

KEY WORDS: Blood culture, Salmonella, Widal test, Enteric fever.

Dr. Shilpa Yashwant. Pawar	Assistant Professor, Dept. of Pediatrics, Govt. Medical College Hospital, Aurangabad, Maharashtra. - Corresponding Author
Dr. Smita Mundada	Assistant Professor, Dept. of Pediatrics Govt. Medical College Hospital, Aurangabad, Maharashtra.
Dr. Amol Suryawanshi	Associate Professor, Dept. of Pediatrics Govt. Medical College Hospital, Aurangabad, Maharashtra.
Dr. Rakesh Chiklonde	Assistant Professor, Dept. of Pediatrics Govt. Medical College Hospital, Aurangabad, Maharashtra.
Dr. P.S. Patil	H.O.D and Prof. Dept. of Pediatrics ,Govt. Medical College Hospital, Aurangabad, Maharashtra.

ABSTRACT

Introduction: The present prospective observational study was carried at pediatric department of rural medical college and hospital, Loni.
Aims and Objectives: To study the clinical profile of Enteric fever and its outcome in pediatric age group.
Methodology: In pediatric patients of 1 to 12 years, diagnosed primarily as Enteric fever, was the study population. The diagnostic criteria were the clinical presentation suggestive of enteric fever with either positive blood culture for enteric fever or rising antibody titer. Total 40 cases were selected as the study population. The mean age of the patients was 7.6+/-3.1 years. The male to female ratio was equal. The main duration of illness was 12.2 days, the lowest and the highest duration of illness were 7 and 21 days respectively. All patient had fever that is 100 percent. 20 cases (50%) had toxic appearance. Anemia was present in 28 (70%), bradycardia 10 (25%), Tachycardia 12(30%), Hypotension 6(16%), Jaundia 2(5%), Hepatomegaly 22(55%), Splenomegaly 24 (60%), Respiratory system involvement 6(16%), Altered sensorium 10(25%), Meningismus 4(16%), convulsions 10(25%), Aphasia 2(5%) and ataxia 2(5%). Widal test showed that in 5% of patient TO Titers increased to 4 folds, 40% to 8 folds, 18% to 12 folds, 5% to 16 folds and 1% to 20 folds. In Blood culture 6(16%) cases showed positive growth and 1(2.5%) case showed positive Bone marrow culture.
Conclusion: The study concluded that clinical presentation particularly Fever with Hepatosplenomegaly are still very useful clinical parameter for the diagnosis and management of Enteric fever in resource limited country.

Introduction: Enteric fever is a commonly encountered systemic disease caused by gram negative bacteria Salmonella Typhi.¹ For the developing countries of Tropics and sub-tropics it continues to be a big public health problem as the sanitation and public health standards are poor.² Enteric fever is still endemic in South East Asian countries^{3,4}. About 22 million new cases occur each year round the world while 90% of the sufferers are from South East Asia. Reported deaths due to Enteric fever accounts to around 2,16,000 per year⁵. Effective treatment of Enteric fever dates back to 1948; when Woodward introduced Chloramphenicol^{7,8}, subsequently Ampicillin and Cotrimoxazole made worthwhile contribution in the field and changed the outlook as a gold standard of treatment, when case fatality came down to almost 1%. However Chloramphenicol resistant strains made their appearance and big change in the scenario of typhoid fever was observed during the 1970's^{9,10, and 11}.

Multidrug resistance strains of S.typhi with plasmid mediated gene transfer against the first time always is the frequent finding in these days^{11, 12}. Fluoroquinolones, the second line option has also become resistant through the chromosomal mutation in DNA gyrase system of S.typhi^{13,14}. In India, typhoid fever is round the year problem which sometimes takes epidemic proportions.

From the public health point of view one of the reason behind such occurrence is unsafe water supply, defective sewage system and unhygienic food handling practice¹⁵.

Antibiotics are sold over the counter causing inappropriate and indiscriminate use in febrile illness. Drug resistance in enteric fever is a likely outcome of such misusers. A high incidence of multidrug resistance (MDR) enteric fever has been reported from India. The MDR strains showed up with a changed clinical pattern and higher

rates of complications (20%)^{7,14}. It has been observed that overall scenario of disease changed with time. The diagnostic and treatment modalities have been undergoing revisions and changes periodically.

Many reports from developing countries showed that clinical presentation, diagnosis and treatment of enteric fever have significantly altered often leading to missed diagnosis¹⁶. The present approach is thus to update our knowledge about disease, so that time required changes can be made in the diagnosis and treatment of Enteric fever.

METHOD:-This study was prospective observational study, carried out at Department of Pediatrics, Rural Medical College and Hospital over a period of 2 years. 40 pediatric patients of age between 1-12 yrs, diagnosed as a typhoid fever were our study population. Patient were diagnosed by clinical presentation suggestive of typhoid fever with positive blood culture for Salmonella or a fourfold rise in antibody titre¹⁵. Enteric fever patients above 12 years of age with any other co-morbidities were excluded from study.

RESULTS (observations): The finding of the study derived from data analysis are presented below.

TABLE 1- AGE DISTRIBUTION OF PATIENT (N=40)

Age (year)	Frequency	% percentage
1-3 years	1	2.5
3-6 years	8	20
>6 years	31	77.5
Total	40	100%

AGE INCIDENCE OF ENTERIC FEVER PATIENT

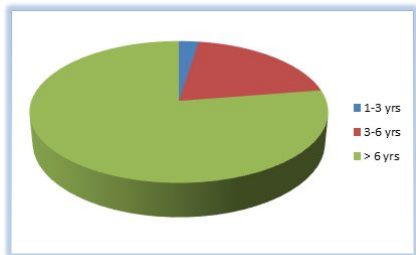


Table 1 shows 77.5% of the patients were above 6 years of age, followed by 20% between 3-6 years of age and only 2.5% between 1-3 years of age. The lowest and highest age 1.5 years and 12 years respectively. Sex distribution out of 40 patient, 50% each were male and female respectively.

TABLE 2 : DISTRIBUTION OF PATIENT BY TIME OF PRESENTATION

Week of presentation	No. of cases	Percentage (%)
1st week	6	15
2nd week	22	55
3rd week	9	22.5
>3rd week	3	7.5
Total	40	100

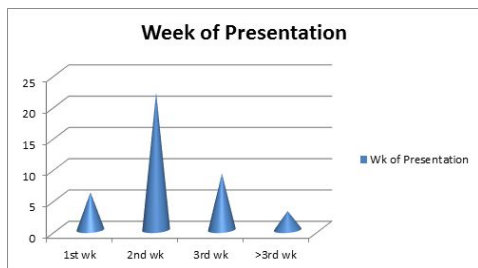


Table 2 shows that 55%(22) of patient presented during 2nd week of illness, 22.5%(9)of patient during 3rd week, 15% and 7.5% during 1stand more than 3rd week respectively.

Table 3: OVERALL CLINICAL PRESENTATION OF THE PATIENT (N=40)

Clinical presentation	Frequency	Percentage (%)
Fever	40	100
Toxic appearance	20	50
Relative bradycardia	10	25
Anaemia	28	70
Tachycardia	12	30
Hypotension	6	16
Jaundice	2	5
Hepatomegaly	22	55
Splenomegaly	24	60
Adventitious sounds in R/S	6	15
Altered sensorium	10	25
Meningismus	4	10
Convulsion	10	25
Aphasia	2	5
Ataxia	2	5

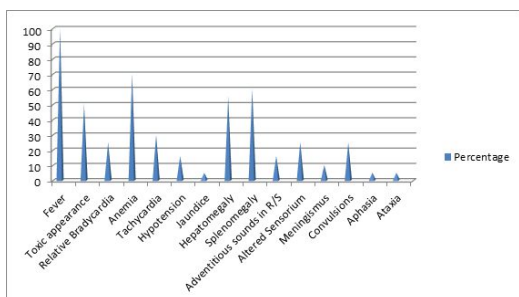


Table 3 shows that all 40 patients (100%) had fever, 20 patients (50%) had toxic look, 25% have relative bradycardia while 30% had tachycardia. Hepatomegaly was seen in 55% and splenomegaly was seen in 60% of the cases. 25% had altered sensorium, 10% had Meningismus and 25% had convulsions while aphasia and ataxia were seen in 5% cases each.

TABLE 4: ANALYSIS OF COMPLICATIONS

Complication	No. of cases	Percentage (%)
Central Nervous System		
· Meningismus	4	10
· Encephalopathy	10	25
· Aphasia	2	5
· Cerebellar Ataxia	2	5
GASTROINTESTINAL SYSTEM		
· GIT Haemorrhage	2	5
· Paralytic ileus with peritonitis	5	12.5
· Mesenteric lymphadenitis	2	5
· Subacute intestinal obstruction	2	5
RESPIRATORY SYSTEM		
· Pneumonitis/bronchitis	6	15
HEPATOBIILIARY SYSTEM		
· Acute cholecystitis	3	7.5
· Hepatitis	2	5
CARDIOVASCULAR SYSTEM		
· myocarditis	1	2.5
GENERAL		
· Osteomyelitis	1	2.5

Complications observed in 45% of patients were Neurological complications like Encephalopathy (25%), Meningismus(10%), Aphasia(5%) and Ataxia(5%). GIT complication were next in order with, Acute cholecystitis (3cases), Peritonitis(2cases), mesenteric lymphadenitis (5cases), subacute intestinal obstruction(2 cases), paralytic ileus with peritonitis(5 cases), Hepatitis and gastrointestinal haemorrhage (2cases each). Pneumonia was observed in 16%, whereas one case each of Myocarditis and Osteomyelitis.

TABLE 5: ANALYSIS OF CULTURE and SENSITIVITY

	No of sample	No of positive sample	Percentage (%)
Blood culture	40	6	15%
Urine culture	12	Nil	
Stool culture	12	Nil	
Bone marrow culture	4	1	2.5
CSF culture	10	nil	

Out of 40 case, in 6 cases Salmonella Typhi was isolated from blood. It account for 15% of cases. In 12 cases urine and stool culture were done as they presented during 3-4th week of illness which was Sterile. 1 case out of 4 shows Salmonella Typhi positive on bone marrow examination. CSF culture of all 10 cases were sterile.

DISCUSSION:- Salmonella Typhi remains as a major problem in developing country like India. It continues to be major part of morbidity and mortality in tropical country especially among children^{17,18}. The clinical profile of enteric fever is serious and atypical manifestation often make diagnostic problem, especially in childhood. The present study was conducted to assess the current pattern of Enteric fever. In our study we found mean age of patients to be 7.6±or-3.1 years and lowest and highest ages were 1.5 yr to 12 yrs respectively and male to female ratio was 1:1. All patients (40 i.e 100%) had fever but classical step ladder pattern of fever was not seen in our study. The classical enteric fever is characterised by insidious onset of sustained fever, severe headache, malaise, abdominal pain, non-productive cough, a relative bradycardia and Hepatosplenomegaly (50%)¹⁹. Common features of Enteric fever, found in another study of Haq et al (1997) were step ladder pattern of rise of temperature, loose motion, relative bradycardia and coated tongue. In our study we found

fever in all 100% patient but not classical step ladder pattern. Fever is the most common symptoms observed in Enteric fever in almost all the studies^{20,21,22,23}. The fever was continuous type seen in 72.5% of cases and remittent type in 27.5% cases. S.K. Sen et al reported continuous pattern of fever in 71.7% and remittent in 22.2% cases in their study²⁴. In this study as shown in table 3 Toxic appearance (50%), Bradycardia (25%), Anemia (70%), tachycardia (30%) hypotension (16%), jaundice (5%), Hepatomegaly (55%), Splenomegaly (60%), Adventitious sound on R/S examination (15%), altered sensorium (25%), meningismus (10%), convulsion (25%), aphasia (5%) and ataxia (5%) were seen. Various neuropsychiatric manifestation observed in present study were abnormal behavior with altered sensorium and irrelevant talking in 10 (25%), convulsion 10 (25%), meningismus 4 (10%), ataxia 2 (5%), and aphasia 2 (5%) cases. H.D. Joshi et al reported altered sensorium in around 13% cases²¹. Sen and Mahakur et al reported meningismus in 22% cases and convulsion in 14% cases²⁴. H.L. Wallace et al noted Atonia in 2.5% cases and Aphasia in 3% cases in their study²⁵. Anaemia seen in 28 (70%) of cases. Sood and Taneja et al noted severe anaemia in 53% of their cases²⁶. Toxic look was present in 20 (52.5%). J.C. Patel et al reported toxic appearance in 79.2% of cases²⁷. One of the most common and important clinical finding in Enteric fever is Splenomegaly. Its characteristics of Enteric fever.

In present study, Splenomegaly was present in 24 (60%) of cases. K.K. Pandey et al and Sen and Mahakur et al reported the incidence of splenomegaly as 78% and 22.2% of cases respectively^{28,24}. Hepatomegaly was observed in 22 (55%) cases.

It was moderate, soft and nontender hepatomegaly. It was markedly tender in 2 cases who had Typhoid Hepatitis. Singh et al noted hepatomegaly in 80% cases²⁹.

Tachycardia noted in 12 (30%) cases. Relative bradycardia seen in 10 (25%) cases which is characteristics feature of Enteric fever. T.O. Mullighan et al observed tachycardia in 15.3% cases, Chawla et al noted relative bradycardia in 4% cases and tachycardia noted in 8% of cases^{20,31}.

Neck stiffness as a sign of meningitis/ Meningismus was noted in 4 (10%) cases, in the present study. H.D. Joshi et al noted in 8 (21%) of cases²¹. Adventitious respiratory sounds present as ronchi or crepts were observed in 6 (16%) of cases suggesting involvement of respiratory system in the form of bronchitis or pneumonitis. T.O. Mullighan et al noted involvement of Respiratory System in 16% cases²⁰. No cases with rose spots were seen. In our study, complication were observed in 18 cases, out of 40 cases, the incidence being 45%. A.C.B. Wicks et al reported in 16% of cases and Joshi et al reported it in 38.7% of cases in their study³². The complications due to Typhoid organisms such as typhoid abscess, osteomyelitis, pneumonia, meningitis, arthritis were less commonly seen. But usually multisystemic affection is seen in Enteric fever³³.

Table no.4 shows details of various complications observed in present study. Majority of complications were observed in the age group of above 6 years.

The incidence of neurological complications in present study was 10 (25%) cases. Encephalopathy and meningismus were the most commonest neurological complications. P.D. Gulati et al noted it in 26.5% of cases²¹. Encephalopathy was seen in 10 (25%) of cases. All patients presented during the last half of the first week or during 2nd week.

Joshi et al reported Encephalopathy in 13% cases²¹. No cases of meningitis were seen in the present study. Meningismus 4 (10%), Aphasia 2 cases (5%) was seen. Aphasia was transient type with complete recovery after 7-8 days. Aphasia was noted by H.L. Wallace in 3% cases²⁵. Cerebellar ataxia seen in 2 cases (5%). Joshi et al noted in 3.5% cases²¹. All patient recovered in 10-15 days completely. Gastrointestinal haemorrhage seen in 2 (5%) of cases. It was in the form of malena and hematemesis. Intestinal perforation was not observed in the study. Pathania et al reported

11.8% of GIT haemorrhage and 0.9% of intestinal perforation³⁵, paralytic ileus observed in 2 cases (5%) and lobar pneumonia in 6 (15%). We noted myocarditis in 1 case (2.5%). H.D. Joshi reported it in 1.8% cases²¹. Osteomyelitis due to Salmonella Typhi infection was noted in 1 case. Renal, haematological complications, arthritis etc were not observed in this study. Widal test was positive in 28 (70%) cases in the present study. 30% cases showed positive widal test during the third week of illness and 40% during 2nd week. Blood culture was done in all 40 cases on admission. In 6 (15%) cases, the blood culture grew salmonella typhi organism. Low positivity may be due to administration of antibiotic prior to hospitalization. Col.C.H. Gidvani et al reported positive blood culture in 41.7% cases³⁶. All 6 blood culture positive cases were resistant to in vitro Ampicillin, Amoxycillin and Co-trimoxazole, while they were sensitive to Chloramphenicol, Amikacin and strongly sensitive to Cefotaxime, Cefazidime, Cefixime and Ceftriaxone with intermediate sensitivity to Ciprofloxacin.

Bone marrow culture done in 4 cases (10%) which were Widal and blood culture negative among which 1 case was positive. Urine and stool culture was done in 12 cases who presented in 3rd and 4th week of disease, but culture was sterile in all the cases. CSF culture was done in 10 cases, in whom meningitis was suspected. It was sterile in all the cases.

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