A Study of Clinical Spectrum of Enteric Fever in Pediatric Age Group in a Tertiary Healthcare Centre

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Abstract

Background and Objectives: Typhoid is an important public health challenge for India, especially with the spread of antimicrobial resistance. The decision about early usage of antibiotics and understanding the clinical presentation is important. A clinical study of spectrum of enteric fever in pediatric age group in a admitting to a tertiary healthcare centre.

Methods: A detailed history was taken, history regarding allergies to any drugs was asked. Clinical examination was done. A detailed questionnaire was recorded as per the proforma. These subjects were investigated for Hb%, TC, DC, ESR, Blood culture, WIDAL test, stool routine, urine routine. Blood samples were drawn under aseptic precautions and subjected for blood counts and cultures in children who were admitted with fever. All the data was expressed in percentage, mean or standard deviation.

Results: The clinical features and the laboratory data were studied in 40 cases of enteric fever diagnosed by Widal test. Fever was the main presenting feature in all cases [100%]. About 5 cases (12.5%) were found to have hemoglobin levels < 9 gm/dl, 12 cases (30%) had hemoglobin levels 9 - 11 gm/dl and the remaining 23 cases (57.5%) had normal hemoglobin levels and the mean and standard deviation was 11.46 ± 1.80. The total leucocyte count was normal in 34 children (85%) and elevated leucocyte counts in 6 cases (15%) and the mean and standard deviation was 7895.00 ± 2952.09. The ESR was elevated in 32 cases (80%). The remaining 8 cases (20%) were in normal range and the mean and standard deviation was 29.68 ± 15.81. In the present study hepatomegaly was noted in 22 cases (55%) and splenomegaly was noted in 15 cases (37.5%). In the present study only 19 cases were found to have coated tongue and 17 cases out of 40 (42.5%) had toxic look at the time of admission.

Conclusions: In conclusion with the above study, children up to 15 years presenting with fever of more than 5 days in association with toxicity, hepatomegaly, and coated tongue with non-availability of lab setup, prompt initiation of enteric fever treatment will avoid both morbidity and mortality.

Keywords: Spectrum; Enteric Fever; Typhoid; Widal Test

Introduction

Enteric fever is characterized by a non-specific illness with low grade fever, malaise, dry cough and abdominal pain. The infection is caused by Salmonella enterica serovar Typhi and Salmonella enterica serovar Paratyphi acquired by ingestion of contaminated food and water. Early recognition and intervention are important for preventing ongoing transmission, morbidity and mortality.

It is estimated that globally there are 27 million cases of enteric fever occurring each year which estimates mortality varying from 216,000 to 600,000 per annum [1,2]. The majority of cases of enteric fever are reported in south Asia. It is considered as significant burden in India [3].

The incubation period is usually 7-14 days, but it may range from 3 - 30 days, depending mainly on the size of the ingested inoculums. In a classical case of typhoid fever in children, the onset of the symptoms is insidious. The patient will have malaise, headache, generalized aches in the muscle joints and abdominal Pain. Vomiting may be present with loss of appetite. Step ladder pattern of fever that is described in adults, may not be seen in children. By the end of the first week, the patient will have toxic look with coated tongue. The spleen is usually palpable in the second week. The rose spots that are described in typhoid fever are very rare in children. Ronchi and scattered rales may be heard on auscultation of the chest.

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Objectives

A clinical study of spectrum of enteric fever in pediatric age group in a admitting to a tertiary healthcare centre.

Methodology

The study was conducted at Kempegowda Institute of Medical Sciences Hospital over a period of ten months (February 2016 to October 2016). In this prospective clinical study, suspected cases of enteric fever up to fifteen years were admitted to the pediatric ward.

On admission, these subjects were enrolled in to the study. A detailed history was taken, history regarding allergies to any drugs was asked. Clinical examination was done. A detailed questionnaire was recorded as per the proforma. These subjects were investigated for Hb%, TC, DC, ESR, Blood culture, Widal test, stool routine, urine routine. Blood samples were drawn under aseptic precautions and subjected for blood counts and cultures in children who were admitted with fever. The cases, which were negative for blood cultures and widal test even in the second week of illness, were excluded from the study. Intravenous route antibiotics were started after drawing samples for investigations. The treatment was started on these subjects. Follow up will be advised for three months.

Inclusion Criteria: Clinically suspected cases of enteric fever up to the age of 15 years.

Exclusion Criteria:

1. Patients with enteric fever above the age of 15 years.
2. Patients who have Para typhoid fever.
3. Those patients who have failed to come for follow up.
4. Cases who had received prior antibiotics were not included in the study.

Sample size: 40 cases.

Results

In the present study fever was the symptom present in all the cases (100%).

Presenting Symptoms

<table>
<thead>
<tr>
<th>Presenting symptoms</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>Vomiting</td>
<td>11</td>
<td>27.5</td>
</tr>
<tr>
<td>Pain abdomen</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>Loose stools</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Cough</td>
<td>7</td>
<td>17.5</td>
</tr>
</tbody>
</table>

In the present study 11 cases out of 40 cases (27.5%) presented in the first week, 28 cases presented in the second week (70%), only one case presented in the third week of fever (2.5%).

Clinical abdominal findings

<table>
<thead>
<tr>
<th>Clinical abdominal findings</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatomegaly</td>
<td>22</td>
<td>55</td>
</tr>
<tr>
<td>Splenomegaly</td>
<td>15</td>
<td>37.5</td>
</tr>
</tbody>
</table>

In the present study hepatomegaly was noted in 22 cases (55%) and splenomegaly was noted in 15 cases (37.5%).

<table>
<thead>
<tr>
<th>Hemoglobin</th>
<th>Number (n = 40)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 9.0 gm/dl</td>
<td>5</td>
<td>12.5</td>
</tr>
<tr>
<td>9.1 - 11 gm/dl</td>
<td>12</td>
<td>30.0</td>
</tr>
<tr>
<td>&gt; 11 gm/dl</td>
<td>23</td>
<td>57.5</td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>11.46 ± 1.80</td>
<td></td>
</tr>
</tbody>
</table>

A Study of Clinical Spectrum of Enteric Fever in Pediatric Age Group in a Tertiary Healthcare Centre

In the present study, 5 cases (12.5%) were found to have hemoglobin levels < 9 gm/dl, 12 cases (30%) had hemoglobin levels 9 - 11 gm/dl and the remaining 23 cases (57.5%) had normal hemoglobin levels and the mean and standard deviation was 11.46 ± 1.80.

<table>
<thead>
<tr>
<th>Total counts</th>
<th>Number (n = 40)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>4000 - 11000</td>
<td>34</td>
<td>85.0</td>
</tr>
<tr>
<td>&gt; 11000</td>
<td>6</td>
<td>15.0</td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>7895.00 ± 2952.09</td>
<td></td>
</tr>
</tbody>
</table>

In the present study total leucocyte count was normal in 34 children (85%) and elevated leucocyte counts in 6 cases (15%) and the mean and standard deviation was 7895.00 ± 2952.09.

<table>
<thead>
<tr>
<th>ESR</th>
<th>Number (n = 40)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal Male ≤ 15 : Female ≤ 20</td>
<td>8</td>
<td>20.0</td>
</tr>
<tr>
<td>Abnormal Male &gt; 15 : Female &gt; 20</td>
<td>32</td>
<td>80.0</td>
</tr>
<tr>
<td>Mean ± SD</td>
<td>29.68 ± 15.81</td>
<td></td>
</tr>
</tbody>
</table>

In the present study ESR was elevated in 32 cases (80%). The remaining 8 cases (20%) were in normal range and the mean and standard deviation was 29.68 ± 15.81.

**Discussion**

Currently, it is estimated that there are > 26 million patients with a blood culture positive for enteric fever annually with a 1% fatality rate [4]. The majority of existing epidemiological evidence comes from studies in adult populations. There are conflicting opinions about the rate of disease in young children, especially infants [5]. In the present study fever was the symptom present in all the cases (100%). In the present study 11 cases out of 40 cases (27.5%) presented in the first week, 28 cases presented in the second week (70%), only one case presented in the third week of fever (2.5%).

In the present study 22 cases out of 40 (55%) had continuous fever, 11 cases (27.5%) had intermittent fever and 7 cases (17.5%) had remittent fever. Garg., *et al.* have reported continuous fever in 77% of his cases in 1994 [6]. Stepladder pattern of fever was not noticed in any cases in the present study. Kapoor, *et al.* described that stepladder pattern of fever was not seen in children [13].

In the present study, pain abdomen was the symptom in 15% of the cases. Pain abdomen was mild, diffused and colicky in nature confined to the upper abdomen. Garg., *et al.* have reported 28% of cases with pain abdomen in their study.

In the present study vomiting was noticed in 11 cases (27.5%). The vomiting was one or two episodes, which was non-projectile in nature and most of the time it was due to forced oral feedings.

**Clinical Findings**

In the present study only 19 cases were found to have coated tongue out of 40 cases. Kapoor, *et al.* have noted 45.2% incidence of coated tongue in their study [13]. R K Arora., *et al.* have reported 33% of coated tongue in their study [8]. A study done by Iqbal., *et al.* has reported 72% had coated tongue to be significant in their study [9].

In the present study 17 cases out of 40 (42.5%) had toxic look at the time of admission. Garg., et al. noted 22.2% of cases with toxic look in their study [6]. R K Arora., et al. have reported 39.8% cases of toxic look in their study [8].

There were no cases with relative bradycardia in the present study. R K Arora., et al. have noted 11.6% of their cases with relative bradycardia [8]. Davis TM., et al. suggested that relative bradycardia is not characteristic of enteric fever in children [10].

In the present study hepatomegaly was noted in 22 cases out of 40 (55.0%). R K Arora has reported 45.6% cases with hepatomegaly in their study [8]. A study done by Iqbal., et al. has reported 77% had hepatomegaly to be significant in their study [9].

In the present study splenomegaly was noted in 15 cases out of 40 (37.5%). Garg., et al. have reported 55% of their cases with splenomegaly in their study [6]. Rohini Kalhan., et al. have reported 64% of splenomegaly in their study [11]. A study done by Iqbal., et al. has reported 68% had splenomegaly to be significant in their study [9].

According to text books, the rashes that are associated with typhoid fever are known as rose spots. In the present study there were no cases with rose spots. YF Yap., et al. reported rose spots were uncommonly seen in Malaysian children (7.4%) [12]. This is probably due to the darker pigmentation of Asian skin.

**Investigations**

In the present study, 5 cases (12.5%) were found to have moderate anemia, 12 cases (30%) were mild anemia and the remaining 23 cases (57.5%) had normal hemoglobin levels. Thus the incidence of anemia in the present study was 42.5%.

In the present study total leucocyte count was normal in 34 children (85%) and elevated leucocyte counts in 6 cases (15%). Leucopenia was not noted in the study. Sood., et al. noted increased total counts in 22.1% and leucopenia in 24.2% cases [13].

In the present study ESR was elevated in 32 cases (80%). The remaining 8 cases (20%) were in normal range. Other studies have shown elevated ESR in typhoid fever. In bacterial infections ESR may be elevated.

**Widal Test:** All cases were positive for widal test.

The gold standard for the diagnosis of enteric fever is by isolation of salmonella typhi from the blood. The yield of blood cultures fall after first week. Isolation of salmonella by blood has more advantage over urine and stool cultures because it certainly shows that the subject is suffering from enteric fever [14]. In the present study 6 cases (15%) have shown salmonella growth in blood culture. Among those 5 cases (12.5% of the total cases) were in first week and only one case (2.5%) of the total cases were in the second week of fever. No case showed blood culture growth in third week.

Children who had received prior antibiotics before admission were excluded from the study.

**Conclusion**

- In the clinical spectrum of the present study fever was the presenting symptom in all the cases. Coated tongue was only in 19 (45.2%). Toxic look at admission was in 17 cases (42.5%).
- Vomiting was noticed in 27.5% cases. Pain abdomen was the symptom in 15% of the cases. Loose stools were present in 5% cases. Cough was present in 17.5% cases.
- Hepatomegaly was noted in 55% cases and splenomegaly was noted in 37.5% cases.
- In conclusion with the above study, children up to 15 years presenting with fever of more than 5 days in association with toxicity, hepatomegaly, and coated tongue with non-availability of lab setup, prompt initiation of enteric fever treatment will avoid both morbidity and mortality.
Bibliography


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