Clinical Profile of Enteric Fever in Children of a Tertiary Care Centre in Kathmandu, Nepal

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ABSTRACT

Background: Enteric fever, commonly known as typhoid fever is a global public health problem. It is one of the common infectious diseases of humans, fever lasting for more than 7 days. It is transmitted by faeco-oral route and common in the areas with poor sanitation. Globally, majority of the Typhoid fever is caused by Salmonella enterica var typhi, one fifth of the infection is caused by Salmonella enterica var paratyphi. This study was conducted to describe clinical and laboratory parameters among children with enteric fever.

Methods: It was a descriptive cross-sectional study conducted in the Pediatric ward and Pediatric Intensive Care Unit (PICU) of Nepal Medical College Teaching Hospital (NMCTH), Atterkhel, Kathmandu, Nepal from 2015 January to 2015 December. Inclusion criteria: clinical details and laboratory parameters of children aged 13 months to 15 years old with diagnosis of enteric fever was obtained in the proforma and descriptive statistics were calculated.

Result: A total of 1,020 children with the sign and symptom suggestive of enteric fever were admitted in the inpatient department (Pediatrics) during the study period. All the enteric fever suspected children were tested for blood culture, Widal test and complete blood count, out of them 80 children were diagnosed as enteric fever. Male female ratio is 1.6:1. Fever was the most common clinical feature observed in 95% cases and other common features were loose motion (37.5%), vomiting (33.8%) and abdominal pain (27.5%). Hepato-splenomegaly is common finding of Enteric fever reported in 85.0% and 43.7%. Majority of the patients had normal leucocyte count (71.0%) and leucopenia reported in 20.0%.

Conclusion: Fever and hepato-splenomegaly were the major clinical presentation of typhoid fever in our study. Other less common features were loose motion, vomiting and abdominal pain. This finding may be useful for the pediatrician and other health professionals for the early diagnosis of enteric fever.

Keywords: Clinical profile, Enteric fever, Blood culture, Widal test, Leucopenia, hepatomegaly and Splenomegaly

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INTRODUCTION

Enteric fever is a global public health problems, and over 21 million are getting infected and 0.2 million people are died annually.[1,2] Almost 90% of the cases were from Asia.[3] The trend of enteric fever prevalence is increasing worldwide, in 2010 the prevalence of enteric fever was higher in African countries (724.6/100,000) than in Asian countries (170.8/100,000).[4] In 2015, it was estimated 17 million cases of typhoid and paratyphoid fever with highest affected people seen in South Asia and other areas were Southeast Asia and Sub-Saharan Africa.[5,6]

Fever, that last for more than 7 days is the most common clinical manifestation present in almost all patients with enteric fever.[2,3] Other features are vomiting, headache, abdominal pain and diarrhea along with clinical signs and hepato-splenomegaly.[7,8] Clinical features of typhoid and paratyphoid fever are generally similar, although paratyphoid infection tends to be a more milder form.[7] Rose spot, round, non-pruritic, erythematous papules, about 6-12 in number are mostly seen in trunk in typhoid fever, however, such Rose Spot are found significantly higher number in paratyphoid fever.[9]

In Nepal, it is also known as *Myade Jworo* or *Bisham Jworo* locally and was a major cause of morbidity and mortality both in children and adult population.[10,11] This disease is predominantly seen in school children and old adult however this infection is less common in infant and preschool children.[10,12] Although the blood culture is the gold standard for diagnosis Typhoid fever, in most developing countries the Widal test is most commonly used.[13] The widely used serodiagnostic techniques, Widal test that measures the antibody titres to the somatic 'O' and flagellar 'H' antigens. Although the overall sensitivity of the Widal test is approximately 70-80% with the specificity ranging from 80-95%.[13,14]

In many areas typhoid becomes the leading differential diagnosis of a patient with a fever which has lasted for more than one week.[3,15] To exclude the other causes of fever and support clinical diagnosis, there has been a strong need to conduct a research on the typical as well as atypical presentation of typhoid fever in the pediatric population. Hence, we conducted this study to find out the real clinical presentation of this disease in Kathmandu valley.

MATERIALS AND METHODS

It is a descriptive cross-sectional study conducted in the Pediatric ward and Pediatric Intensive Care Unit (PICU) of Nepal Medical College Teaching Hospital (NMCTH), Atterkhel, Kathmandu, Nepal from 2015 January to 2015 December.

NMCTH is a Tertiary Care super speciality Hospital situated in Kathmandu valley. This hospital has been providing health services to the people of whole country especially Kathmandu valley. We included all pediatric patient admitted in pediatric ward and PICU of the NMCTH, age ranging from 13 months to 15 years who was having fever (by history and or clinical examination) and symptoms suggestive of Enteric fever and investigated them with Blood culture, Widal test and complete blood count urine and stool analysis. Chances of having Enteric fever is about any form of treatment locally (antibiotic, analgesic, anti-inflammatory and any other) prior to admission in the hospital

We called a patient as an Enteric Fever (Typhoid fever) to those who was presented with the fever more than 3 days (by history or clinical examination), and clinical features suggestive of fever with Positive Blood culture and or positive Widal test: antibodies to H (flagellar antigen) and O (somatic antigen) titre >1:160.

Additionally, we also sent blood for total leucocyte count (TLC) or White Blood Cell (WBC) count and considered normal blood WBC count if result came ranges from 5,000 to 10,000 WBCs/microliter. Similarly, we considered the leucopenia for WBC count below 5,000 and leukocytosis for count more than 10,000 cells ml.

Moreover, we considered normal platelet count if count came with the range of 150,000-400,000 platelets/microliter and thrombocytopenia if platelets count came below 150,000 platelets/microliter. We collected data in the preformed proforma from the patient and guardian of the patient after taking consent and entered in to the SPSS 16 for data analysis.

RESULT

A total of 1,020 children with the sign and symptom of fever were admitted in the inpatient department (Pediatrics) during the study period. All the enteric fever suspected children were tested for blood culture, Widal test and complete blood count, urine and stool analysis, out of them 80 children were diagnosed as enteric fever. The source of drinking water in the patient of our study was tap water in 93.8% and filtered water in 6.2% of the case.

Table 1: Socio-demographic Profile:

Caste	Frequency	Percent
Brahmin/Chhetri	31	38.8
Janajati	41	51.2
Lower caste	8	10.0
Total	**80**	**100.0**
Age groups		
0-5 years	17	21.3
6-10 years	20	25.0
11-15 years	43	53.8
Total	**80**	**100.0**
Gender		
Female	31	38.8
Male	49	61.3
Total	**80**	**100.0**

More than one third (38.8%) of the patients admitted with the diagnosis of Enteric Fever were from *Brahmin* and *Chhetri* origin whereas more than half (51.2%) of patient were from *Janajati* and only few (10.0%) patients were represented to lower casts like, *damai, kami* and *dalit*.

Similarly, more than half (53.8%) of the total admitted children were from age group 11-15 years old whereas age group 6-10 years patients were 20% and approximately one fifth (21.3%) admitted children were age group 1-5 years old . Furthermore, majority of the admitted patients were male (61.3%) (Table1).

Table 2: Clinical Profile of Enteric Fever

SN	Clinical features	Frequency (n=80)	%
1	Fever	76	95.0
2	Loose motion	30	37.5
3	Vomiting	27	33.8
4	Abdominal pain	22	27.5
4	Cough	19	23.8
5	Headache	16	20.0
6	Decrease appetite	8	10.0
7	Nausea	4	5.0
8	Tongue: Coated	33	41.3
9	Hepatomegaly	68	85.0
10	Splenomegaly	35	43.7
11	Hepatosplenomegaly	34	42.5

The most common presenting feature was fever, almost all (95%) of the patient were presented with the complaint of fever either by history or by examination. Next to the fever, loose motion was second problem noted in more than one third (37.5%) children, other feature were vomiting, abdominal pain, cough, headache reported in (33.8%), (27.5%), (23.9%), (20.0%) of children respectively. The least common complaint observed nausea only in 5.0% of cases (Table 2).

On clinical examination at the time of admission, more than half (53.8%) of the patients were ill looking; only few patients (6.3%) were toxic or lethargic and rest of the children looked normal. Similarly, (41.3%) of the study group had coated tongue. While abdominal examination, majority (85.0%) of the patient had hepatomegaly and more than one third (43.7%) patient had splenomegaly among them only 1.3% of patients had massively enlarged spleen (Table 2).

Table 3: Laboratory findings

S N	Parameter	Frequency (n=80)	%
1	Leukopenia	16	20
	Normal WBC Count	57	71
	Leukocytosis	7	9

2	Widal Test positive >1:160	57	71
3	Blood culture positive	25	31
4	Anemia	23	28.7
5	Thrombocytopenia	8	10

Blood report showed leukopenia in 20.0% cases, leukocytosis noted only in 9.0% cases and vast majority (71.0%) children had normal white blood cell count. Similarly, Widal test reported as positive in 71.0% cases. Additionally, blood culture test performed in all cases out of them approximately one third (31.0%) had positive blood culture test. Similarly, 28.7%, 10.0% cases had reported Anemia and Thrombocytopenia among all study groups.

More than two third (67.5%) of study population had used antibiotics before they came to the hospital, similarly, 30% patients had no any form of medication before attending hospital and only 2.5% patient had antipyretics or antipyretic and anti-inflammatory.

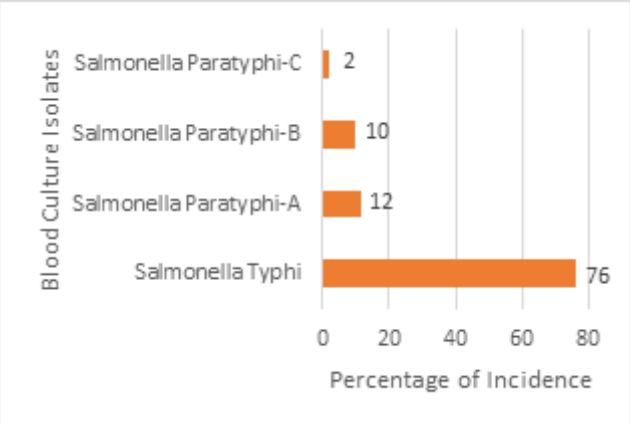

Figure 1: types of bacteria among growth positive in percentage

More than three fourth (76.0%) of the total cases, *salmonella typhi* was isolated and remaining were different strains of *Salmonella paratyphi* A, B and C. *Salmonella paratyphi* A, B and C growth reported in 12.0%, 10.0% and 2.0% cases respectively (figure 1). Culture and sensitivity result showed that all Salmonella isolates in the study were sensitive to ceftriaxone.

DISCUSSION

We have enrolled 80 pediatric patient having typhoid fever, out of them majority of the children were from *Janajati* (53.8%) followed by *Bramin/Chhetri* (38.3%) and minority people was represented by lower cast people (7.8%). The possible cause of this higher prevalence of typhoid fever in *Janajati* was due to their higher population in Kathmandu valley.

Similarly, the incidence of enteric fever was common in the age group of 11 to 15 years age group 53.8% (n=43) and lesser 21.3% (n=17) in age group 1-5 years, this finding was similar to other study conducted in *Dhulikhel* Hospital and a study conducted by Rafiq et al.[16,17] The possible reason might be due to children of this age group seems to be very active and may be exposed to external environment and outdoor activities.

In the present study, Enteric fever was more common in the male population 61.3% (n=49) as compare to female 38.8% (n=31) and the male female ratio of 1.6:1. Similar results was observed in an hospital based study done by Jeeyani et al. in Ahmedbad, India.[18] Male preponderance also seen in another study conducted by Malla et al. in Manipal Hospital.[19]

In literature, fever pattern seen in Enteric fever is step ladder pattern, loose motion, relative bradycardia, hepatomegaly and splenomegaly.[20,21] In present study, the commonest feature observed was fever (95%), similar result observed in the studies done by other authors which is in accordance with the study performed by Rafiq H et al. in Shalamar Hospital in Lahore, Pakistan[17] and Ganesh et al. in Chennai, India[22] Other common features noted in our study were loose motion 37.7% (n=30), vomiting 33.8% (n=27), abdominal pain 27.5% (n=22) and cough 23.8% (n=19). Similar results noted in the study conducted by Bashra Jamil et al. in Pakistan[23] and another study done by Ganesh et al. in Chennai.[22] Cough, headache and decrease appetite were found to be less common in our study. In contrast to our findings, Jog et al. Jeeyani et al.[18] and Ganesh et al[22] reported that none of the patients develop cough in their study. However, 39% of the children were having cough in a study conducted in Dhulikhel Hospital.[16]

In present study, hepatomegaly was noted in 85.0% (n=68) which was matched with the findings of Singh et al.[16] However, only 7.5% of the children had

hepatomegaly in a study conducted in Mumbai by Jog et al.[24] Similarly, various researchers had reported the inconsistent result regarding splenomegaly[16,19], our result showed about half of the children had splenomegaly as compared to hepatomegaly. Although the rose spot is one of clinical sign of the enteric fever, it was not reported in our study.

In present study, majority of the patients had normal total leucocyte count (TLC) 71% (n=57), while 20% (n=16) had leukopenia and only 9% (n=7) study population had leucocytosis. Similar feature of leucopenia (33.3%) and leucocytosis (18.2%) observed in a study.[16,22] The occurrence of anemia (28.7%), thrompocytopenia (10%). Widal test was positive in 71% (n=57) in our study, similar result reported in a study conducted by Malla T et al. in Manipal Teaching Hospital.[19]

The positive blood culture growth observed in our study was 31% (n=25), this result was slightly lower than a study done by Singh DS et al. in Dhulikhel Hospital.[16] They found positive culture report in 37.6% of children, similar result noted in a study performed by Jeeyani et al.[18] A very contrast result (5.4%) was reported in a study conducted by Pokhrel P et al. in Nepal Medical College.[25] In another study carried out in Kathmandu Model hospital reported positive Salmonella culture rate was 23.1%.[26] Ceftriaxone was reported sensitive to all culture positive cases in our study, same sensitivity pattern observed in study conducted by Jeeyani et al., Walia et al. and Singh et al.[16,18,27]

Limitation: This was a small study conducted in one tertiary referral hospital of Kathmandu valley. So the findings of this study may not be generalized for the general population. Hence, we recommend to conduct multi-centered study with large sample size covering the greater proportion of the population.

CONCLUSION

Fever and hepatosplenomegaly were the major clinical presentation of typhoid fever in our study. Other less common features were loose motion, vomiting and abdominal pain. This finding may be useful for the pediatrician and other health professionals for the early diagnosis of enteric fever.

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