Study on Typhoid fever at Lamjung District Hospital, Nepal

Gupta S[1], BK S[2], Thakali K[3], Gupta N[4]

[1]General Practitioner, Lamjung District Hospital, Lamjung, Nepal,[2]Lecturer, Nepalgunj Medical College and Teaching Hospital, Nepalgunj, Nepal,[3] Lecturer, Civil Service Hospital, Kathmandu, Nepal,[4] National Open College, Lalitpur, Nepal

Corresponding Author: Dr Sandeep Gupta, General Practitioner, Besishahar, Lamjung, Nepal, Phone no: +977-9841388684, E-mail: sandeep140@hotmail.com

ABSTRACT

This was a prospective study conducted in the outpatient department and emergency room of Lamjung District Hospital, Western region, Nepal. The main objective of this study was to find out common clinical features, interpret the laboratory results and overview the antibiotic response patterns of patients undergoing treatment at a district hospital of Nepal. A total of 46 adult patients diagnosed with Typhoid fever were enrolled from outpatient clinic and emergency room of Lamjung District Hospital. The study period was 6 months (1st of June to 30th November 2013). The male percentage was 52%. The studied age group of 26-35 year old individuals was predominant (39%), followed by 16-25 years who were 14 (30 %). The occurrence of infection was higher in students (26%) and among patients belonging to middle class family (53%). The most common clinical presentations were fever (100%), headache (95%), anorexia (90%) and abdominal pain (65%). Seventy seven percent of patients had normal white blood cell (WBC) count and 74% had positive Widal test. Third generation cephalosporin (39%) was the most commonly used antibiotics and defervescence period occurred after 5.5+1.5 days of the start of the therapy.

Keywords: clinical features, district hospital, Nepal, typhoid fever,

INTRODUCTION

Typhoid fever is a systemic infection caused by *Salmonella typhi* and *Salmonella paratyphi* A, B and C. The causative organism belonging to the family *Enterobacteriaceae*, is an intercellular gram negative short bacillus that is motile due to peritrickous flagella.[1] The name typhoid fever was given by Louis in 1829 to distinguish it from typhus fever and Eberth 1880 described the typhoid bacillus. Typhoid fever was also called as gastric fever, enteric fever, abdominal typhus, intestinal remittent fever, slow fever, nervous fever and pathogenic fever.[2]

In 2000, it was estimated that over 21.6 million illnesses of typhoid fever had occurred worldwide, resulting in 216,510 deaths of which 90% of this morbidity and mortality occurred in Asia affecting all ages group individuals. South-central and south-east Asia has the highest incidence rate of 100-1000 per 100000 cases per year of typhoid fever. [3-5]

Typhoid fever remains an important and persistent health problem in developing countries including Nepal. The disease is observed all over the year with the peak incidence being reported during months of May till September. This period coincides with the rainy season when the chance of water contamination is high.[6-9] Typhoid fever is a common clinical diagnosis among patients presenting with febrile illness in hospitals of Nepal. The commonly presenting symptoms and signs are high temperature, headache, nausea, anorexia, malaise, abdominal pain, hepatomegaly and spleenomegaly.[4, 6, 10-12]

Fever is the leading cause for consultation at health facilities in Lamjung District and majority of these patients are treated empirically for typhoid fever based on clinical grounds. The aim of this study was to determine the socio-demographic distribution, common clinical features, interpret the laboratory results and assess the antibiotic response patterns of patients undergoing treatment for typhoid fever at Lamjung District Hospital.

MATERIALS AND METHODS

This was a prospective study conducted in the outpatient department and emergency room of Lamjung District Hospital, Besishahar, Lamjung in the western region of Nepal. The inclusion criteria for the study were based on clinical features and total leukocyte count. The clinical features included adults presenting with fever for more than five days, headache, general discomfort/body ache, anorexia, malaise, abdominal discomfort/pain, diarrhea, constipation, nausea/vomiting, hepatomegaly, spleenomegaly and subjects with total leukocyte count below 11,000/mm^3 were included in the study. Patients with any other obvious causes of fever likely due to pneumonia, malaria, abscess and meningitis or any other co-morbidities were excluded from the study. The study period was from 1st June till 30th November 2013.

The study was approved by Internal Management Committee of Lamjung District Hospital. Questionnaires were used to record the patients' medical history and physical examination. Informed consent was obtained from all subjects enrolled in the study. The results were complied, tabulated and analyzed for descriptive statistics.

RESULTS

Among 46 patients, 24 (52%) were males and 22 (48%) were females, the age group of 26-35 years was most predominant (39%), followed by 16-25 years (30%) (Fig.1).

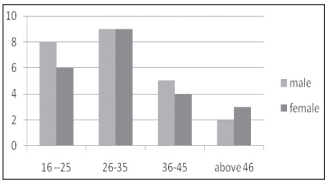

Fig. 1: Age and sex distribution of Typhoid fever patient

As per socio- demographic distribution, typhoid fever was most common among Brahmin and Dalit ethnic groups, occupation wise: students and agriculture workers and living standard wise: people belonging to the middle class (Table 1).

Table 1: Socio-demographic characteristics of studied subjects

Characteristics	Number	Percentage
District		
Lamjung	38	83
Tanahu	5	11
Gorkha	2	4
Manang	1	2
Ethinic group		
Brahmin	14	30
Chhetri	8	17
Dalit	14	30
Gurung	10	23
Occupation		
Student	12	26
Agriculture	10	23
Business	8	16
Service	6	12
Housewife	10	23
Living Standard		
High	8	17
Middle	24	53
Low	14	30

The most common clinical presentation among the typhoid fever patients were fever (100%), headache (95%), anorexia (90%), abdominal pain (65%) and myalgia (52%) (Figure.2)

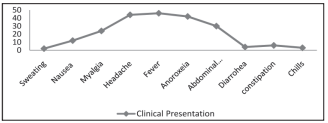

Fig. 2: Distribution of clinical features of typhoid fever patient

The laboratory results showed 77% of the patients had normal and 23% had below 4000/mm^3 WBC count. From the total patients studied, serological-Widal test was positive in seventy four percent (Table.2).

Table 2: Total leucocytes count and Widal test

Tests	Number	Percentage
WBC Count		
<4000/cmm	**10**	**23**
4100-8000/cmm	**30**	**65**
8100-11000/cmm	**6**	**12**
Widal Test		
Positive	**34**	**74**
Negative	**12**	**26**

The study showed 39% of the study population were on treatment with third generation cephalosporin and the defervescence period was of 5.5 +1.5 days. Total day of treatment ranged from 10-14 days in the study group (Table 3).

Table 3: Response to antibiotic treatment

S.N	Antibiotic	Number (%)	Defervescence period	Duration of treatment
1	Ciprofloxacin/ Ofloxacin	15 (33)	6+2	10-14
2	Chloramphenicol	13 (28)	6+1.5	10-14
3	Cefixime/ Ceftrixone	18 (39)	5.5+1.5	10-14

DISCUSSION

Typhoid fever is one of the most common febrile illnesses encountered by practitioners in developing countries, including Nepal where the disease is endemic. Rapid accurate diagnosis and early treatment are important methods for prevention and transmission of the disease.[13] Therefore, diagnosing typhoid fever on clinical diagnostic criteria would be an important modality in treating typhoid fever patients in our country where laboratory diagnostic facilities are generally not available, and blood culture being the gold standard test is positive only in 40-60% of cases.[7, 9, 10, 14-17]

In this study, the incidence of typhoid fever was more common among males than females and infected the economically productive population, this finding being

similar with studies done in other parts of the country.[7, 11, 15] Our study reports student group patients were more vulnerable to typhoid fever and the findings are similar to that of another study done at a teaching hospital in Nepal.

Among the ethnic population, the disease was more common in Brahmin and Dalit groups representing uniform occurrence of the disease in the community. Study from Pokharel *et al* reported typhoid fever marginally higher among the Dalit population compared to Brahmin and other groups.[15] As per living standard, patients in the category of middle class living standard group were the most commonly affected (53%), followed by lower class living standard group 30%. The main route of typhoid transmission is faeco-oral by contaminated food and water, the disease burden remains very high in middle to low socio- economic conditions and overcrowding environment.[11,12, 15]

The four most common clinical presentations presented by patients at Lamjung district hospital were fever (100%), headache (95%), anorexia (90%) and abdominal pain (65%). These clinical features were similar with studies done Kanungo *et al*,[6] Sharma *et al* and Neopane *et al*.[6,7,11] Community based cohort study from Pakistan found fever, anorexia, vomiting and hepatomegaly the commonly presenting clinical features. Hence, these symptoms are characteristics of typhoid fever.[17]

The studied showed seventy seven percent of the individuals to have WBC count within the normal range and twenty three percentage had below 4000/mm^3. The finding is similar to the study of Sharma *et al* where 70% of patients had normal WBC count.[7] The serological- Widal test was positive in 74% of patients for O and H antibody titers > 200 in our typhoid patients. This was higher than a study done in Turkey by Willke *et al* were only 52 % of patients had positive results for O and H antibody titers > 200.[14] The Widal test is easy, less expensive and relatively non invasive. It can be of diagnostic value when blood cultures are not available, however, the results must be interpreted cautiously with the clinical presentations.

Appropriate antibiotic treatment is essential for curing typhoid fever patients to prevent serious complications caused by these gram negative bacteria. In the study, out of 46 patients, 39% of patients responded to third generation Cephalosporin group of drugs (Ceftriaxone/ Cefixime) with defervescence being recorded within 5.5 to7 days . It was followed by Chloramphenicol, where 28% of patients were treated and defervescence was recorded to be 6 to 7.5 days and Fluoroquinolones was prescribed in 33% of patients and defervescence period was recorded as 6 to 8 days.Total days of treatment period varied from 10 to 14 days duration. Another study done in Dhulikhel hospital showed fever clearance time was shortest with Ofloxacin and longest with Chloramphenicol. However, the total days of treatment was 10 days duration .[7] This study was done in a resource limited setting in a hospital in a rural part of Nepal. A larger scale study to evaluate the diagnostic value of clinical presentations of typhoid fever is recommended for the development of treatment regimen to manage and prevent complications from this illness.

ACKNOWLEDGEMENTS

We would like to acknowledge the patients and their family members for their active participation in the study. We would also like to thank the outpatient clinic, emergency room and laboratory staffs of Lamjung District Hospital for the support and help provided during the study.

REFERENCES

1. Jegathesan M. Phage types of *Salmonella* typhii isolated in Malaysia over 10 years period 1970-1979. *J Hyg Lond* 1983; 90: 91-7.
2. Panikar CKJ. Textbook of Microbiology, 7th edition, Orient Longman Private Ltd, pg 290-304.
3. Crump JA, Luby SP, Mintz ED. The Global burden of Typhoid fever. *Bull World Health Organ* 2004; 82: 346-53.
4. Bhan Mk, Bahl R, Bhatnagar S. Typhoid and paratyphoid fever. *Lancet* 2005; 366: 749-62.
5. Ochiai RL, Acosta CJ, Danovaro MC et al. A study of typhoid fever in five Asian countries: disease burden and implications for control. *Bull World Health Organ* 2008; 86: 260-68.
6. Kanungo S, Dutta S, Sur D. Epidemilogy of typhoid and paratyphoid fever in India. *J Infect Develop countries* 2008; 2 (6):454-60.
7. Sharma N, Koju R, Karmacharya B et al. Typhoid fever in Dhulikhel hospital, Nepal. *Kathmandu Univ Med J* 2003; 2:188-92.
8. Sur D, Seidlein VL, Manna B et al. The malaria and typhoid fever burden in the slums of Kolkata, India:data from a prospective community based study. *Trans R Soc Trop Med Hyg 2006*; 100 (8):725-33.
9. Prajapati B, Rai GK, Rai SK et al. Prevalence of *Salmonella typhi* and *paratyphi* infection in children: a hospital based study. *Nepal Med Coll J* 2008; 10: 238-41.
10. Shakya KN, Baral MR, Shrestha R. Astudy of Atypical Manifestations of Enteric Fever in Children. *J Nepal Health Res Counc* 2008; 6 (12): 1-4.
11. Neopane A, Poudel M, Pradhan B, Dhakal R, Karki DB. Entric fever: Diagnostic valve of clinical features. *Kathmandu Univ Med J* 2006; 4: 307-315.
12. Karkey A, Aryzal A, Basnyat B, Baker S. Kathmandu, Nepal: still an Enteric fever capital of the world. *J Infect Developing Countries* 2008; 2 (6): 461-465.
13. Zulfiqar A B. Current concepts in diagnosis and treatment of typhoid fever. *BMJ* 2006; 333: 78-82.
14. Willke A, Ergonul O, Bayer B. Widal Test in Diagnosis of Typhoid fever in Turkey. *Clinc Diag Lab Immun* 2002; 9 (4): 938-41.
15. Pokharel P, Rai SK, Karki G, Katwual A, Vitrakati R, Shrestha SK. Study of enteric fever and antibiogram of *Salmonella* isolates at a Teachiong Hospital in Kathmandu Valley. *Nepal Med Coll J* 2009; 11 (3): 176-78.
16. Acharya D, Bhatta Dr, Malla S, Dumre SP, Adhikari N, Kandel BP. *Salmonella* enteric serovar *Paratyphi* A: an emerging cause of febrile illness in Nepal. *Nepal Med Coll J* 2011; 13 (2): 69-73.
17. Siddiqui FJ,Rabbani F, HasanR, Nizami SQ, Bhutta ZA. Typhoid fever in children:some epidemiology considerations. *Int J Infect Dis* 2006; 10: 215-22.