

Profile of Enteric Fever in Children at Tertiary Care Hospital Sukkur Pakistan

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ABSTRACT

Background; Enteric fever (Typhoid fever) is widely recognized as a major public health problem in developing countries.

Objective: To study the clinical profile and complication of enteric fever in children.

Study Design: Prospective descriptive study.

Place and Duration of Study: This study was conducted at the Paediatric Department at Ghulam Muhammad Mahar Medical College Hospital Sukkur from January 2010 to December 2011.

Materials and Methods: This was a prospective study, included all patients of enteric fever, of both sex and age ranged from 1 year to 13 years. All cases of enteric fever were confirmed by serological test Typhidot IgM or IgM and IgG positive.

Results: A total of 360 patients of enteric fever were studied during 2 years. Mean age of presentation was 7.47 years and 166 (46.12%) patients were < 5 years whereas 194 (53.88%) were > 5 years of age. Male: Female ratio was 2:1. Clinical profile of patients shows, that fever was present in all cases, vomiting 180 (50%), anorexia 180 (50%), headache 126 (35%), abdominal pain 108 (30%), diarrhea 108 (30%), weakness 102 (28.33%), cough 90 (25%), constipation 36 (10%) cases, and coated tongue was found in 275 (75%), tender abdomen 140 (38.88%), hepatomegaly 90 (25.0%), splenomegaly 76 (21.11%), toxic appearance 72 (20.0%), dehydration 70 (19.44%), pallor 54 (15%) and relative bradycardia 12 (3.33%) of cases. Complications were found in 88 (24.44%) of cases, raised ALT in 66 (18.3%) jaundice 6 (1.66%), intestinal hemorrhage in 4 (1.11%), peritonitis and osteomyelitis 3 (0.83%) respectively.

Conclusion: Common clinical features of enteric fever include fever, vomiting, anorexia, abdominal pain, headache, coated tongue, anemia, hepatomegaly and elevated liver enzymes. Diarrhea is more common in children < 5 years. Complication due to late diagnosis and drug resistance will persist in our part of country.

Key Words: Enteric fever, clinical profile, children.

INTRODUCTION

Enteric fever (Typhoid fever) is widely recognized as a major public health problem in developing countries. It is a severe systemic infection caused by *Salmonella typhi*. The disease is endemic in the Indian sub-continent, South-East Asia, Africa, the Middle-East, South and Central America, where provision of pure water supplies and sewage control are inadequate¹. The worldwide incidence of enteric fever is estimated to be approximately 16 million cases annually with 7 million cases occurring in south east Asia alone, accounting for more than 600,000 deaths annually². Ochiai LR et al, in their review of disease burden due to enteric fever from five Asian countries, reported a higher incidence of enteric fever from India, Indonesia and Pakistan³. The exact figures on the incidence and prevalence are not available for Pakistan, but the prevalence is deemed comparable to that in South East Asia. Enteric fever represents the 4th most common cause of death in Pakistan⁴. The disease may occur in all ages, with the highest incidence found particularly in children⁵. Young age was seen in a study from Bangladesh, the 57% of *S. typhi* isolates were in children less than 5 years of age and 27% less than 2 years⁶. Various organs have been

involved in the course of enteric fever, resulting in a wide array of presentation⁷. The presenting symptoms and signs of enteric fever in children differ significantly from those in adults⁸. Enteric fever is associated with significant morbidity and mortality due to emerging multidrug-resistant strains of salmonellae and delay in diagnosis⁹. In a study of 1100 hospitalized children in Pakistan, the mortality rate of 1.6% was found to be related to younger age and multidrug-resistant infection⁹. There is a wide spectrum of clinical presentation and with the emergence of drug resistant enteric fever now a days, the treatment has become still more complex. The objective of our study was to determine the clinical profile and complications of enteric fever in hospitalized children from interior of Sindh, where illiteracy, poverty, overcrowding, contaminated water, unhygienic conditions and lack of health facilities and awareness to poor masses predisposing for the diseases and complications.

MATERIALS AND METHODS

This was a prospective study, included all patients of enteric fever, of both sex and age ranged from 1 year to 13 years. All case of enteric fever was confirmed by serological test Typhidot IgM, or IgM and IgG positive.

After consent from parents or patient a separate pro-forma was filled for each patient. Detailed history with clinical examination was undertaken in all patients. Relative bradycardia was defined as normal heart rate inspite of fever. All patients underwent investigations such as complete hemogram, MP, liver and renal function tests, stool and urine examination, and typhidot test. Additional investigations like chest X-ray, ultrasound of abdomen were done where it was indicated. Anemia was defined as hemoglobin less than 10 g/dl. Leucopenia was defined as total leucocyte count (TLC) less than 4000/cu.mm. Leucocytosis was defined as TLC more than 10,000 cells/cu.mm. Thrombocytopenia was defined as platelet count less than 150,000 lakh / cu.mm. Elevated ALT was defined as ALT more than 40 IU/L and elevated SGPT as more than 26 IU/L.

RESULTS

A total of 360 patients of enteric fever were studied during 2 years. Mean age of presentation was 7.47 years and 166 (46.12%) patients were < 5 years whereas 194 (53.88%) were >5 years of age. Male: Female ratio was 2:1. Table 1 shows the clinical presentation of children on admission. The predominant symptoms were fever in all cases, vomiting 180 (50%), anorexia 180 (50%), headache 126 (35%), abdominal pain 108 (30%), diarrhea 108 (30%), weakness 102 (28.33%), cough 90 (25%), constipation 36 (10%) cases.

Table No.1: Clinical presentation of 360 patients at admission.

Symptoms	No. of patients	%age
Fever	360	100%
Vomiting	180	50%
Anorexia	180	50%
Headache	126	35%
Abdominal pain	108	30%
Diarrhea	108	30%
Weakness	102	28.33%
Cough	90	25%
Constipation	36	10%
Signs		
Coated tongue	275	75%
Tender abdomen	140	38.88%
Hepatomegaly	90	25.0%
Splenomegaly	76	21.11%
Toxic appearance	72	20.0%
Dehydration	70	19.44%
Pallor	54	15.0%
Relative bradycardia	12	3.33%

The signs were coated tongue found in 275 (75%), tender abdomen 140 (38.88%), hepatomegaly 90 (25.0%), splenomegaly 76 (21.11%), toxic appearance 72 (20.0%), dehydration 70 (19.44%), pallor 54 (15%)

and relative bradycardia 12 (3.33%) of cases. Typhidot IgM antibodies were positive in 294 (81.67%) of cases while both antibodies IgM and IgG were in 66 (18.33%) of cases. The anemia was found in 180 (50%) of cases, leucopenia in 72 (20.0%), leucocytosis in 66 (18.3%) and thrombocytopenia in 54 (15%) of cases. Complications were found in 88 (24.44%) of cases, elevated serum alanine and aspartate aminotransferase (> 78 iu/l) were observed in 66 (18.3%), jaundice in 6 (1.66%), intestinal hemorrhage in 4 (1.11%), peritonitis, and osteomyelitis 3 (0.83%) respectively. The other less common complication were seizures, enteric encephalopathy and pancytopenia 2 (0.55%) respectively in each case shown in table 2.

Table No.2: Complications of enteric fever in 360 patients

Complications	No. of patients	%age
Raised ALT	66	18.33%
Jaundice	06	1.66%
Intestinal hemorrhage	04	1.11%
Peritonitis	03	0.83%
Osteomyelitis	03	0.83%
Seizures	02	0.55%
Enteric encephalopathy	02	0.55%
Pancytopenia	02	0.55%

DISCUSSION

Enteric fever still remains a major endemic public health problem in Pakistan especially in areas where healthcare facilities being limited and peoples are illiterate, living in unhygienic surroundings, drinking raw-water from canals and especially in rural areas. Enteric fever accounts for significant cause of morbidity in children in developing countries. In our study 46.12% of patients were under 5 years, similar to the reported by Shah 1, et al¹⁰ from India. Most of 53.88% our cases were older than 5 years as reported in most of studies ^{11,12,13} in children. Also in our patients males were 66.66% more common affected as compared to females, similar to the reported from India by Shah I et al^{10,12} whereas Abdel Wahab et al¹⁴ found equal distribution between the boys and girls. Fever was the most common clinical presentation seen in all (100%) our cases similar to other studies done by other authors, ^{11,12,13,15}. The other common features vomiting, anorexia, coated tongue, tender abdomen, headache, abdominal pain, diarrhea, cough, hepatomegaly, splenomegaly, toxic appearance, seen in our study similar to the reported by Bbutta ZA⁷ and others ^{10,12,13,15,16,17}. Other less common features constipation, dehydration, pallor and relative bradycardia seen in our study comparable to that reported by Tohme et al¹⁷. Relative bradycardia was not a major feature of enteric fever in children in our study similar to that reported by other authors ^{7,10,17}. Most of our patients had normal leucocyte counts similar to earlier reports^{11,18}. Leucocytosis was observed in 18.3% of cases while leucopenia in 20% in our study, the higher leucocytosis

was reported by Shah I et al from India¹⁰ and low leucopenia 9% as compared to our results. The anemia was found in 50% and thrombocytopenia in 15% of our children, while Shah I from India reported in his series 87.9% anemia and 33.33% thrombocytopenia. Complications of enteric fever were seen in 88 (24.44%) of cases which are similar to the previously reported in other studies^{16,17,19}, but very low complications were also 4% reported by Ganesh R et al¹¹ and 18.18% by Shah I et al¹⁰. Elevation of serum aminotransferases was seen in 66 (18.33%) of our cases which is much lower when compared to earlier studies by Ganesh R et al¹¹ where hepatic dysfunction was seen in 57% of cases. Common complications of enteric fever seen in our cases jaundice, intestinal hemorrhage and peritonitis and osteomyelitis similar to our results were by Tohme A^{16,20}. The other less common complications were seizures, enteric encephalopathy and pancytopenia seen in our cases. Complications occur in 10-15% of patients and gastrointestinal bleeding (10%), intestinal perforation (1-3%) and neuropsychiatric manifestations (2-40%) are the most important one reported²¹.

CONCLUSION

Enteric fever continues to be a major health problem in our existing hygienic conditions, resulting in significant number of children requiring hospitalization. Common clinical features of enteric fever include fever, vomiting, anorexia, abdominal pain headache, coated tongue anemia, hepatomegaly, splenomegaly, and elevated liver enzymes. Diarrhea is more common in children < 5 years. Complications due to late diagnosis and drug resistance will persist in our country. Prevention of enteric fever can be possible with safe drinking water, improving personal hygiene and proper disposal of human sewage and mass vaccination in endemic regions.

REFERENCES

- Gillespie S. Salmonella infection. In: Cook GC, Zumla A, editors. *Manson's Tropical Diseases*. 21st ed. London, UK Elsevier Science: Health Science Division; 2003.p.937-947.
- Smith S. Infectious diseases. In: Marcdante KJ, Kliegman RM, Jenson Hal B, Behrman RE, editors. *Nelson Essentials of Pediatrics*. 6th ed. Saunders Elsevier; 2011.p.406-410.
- Ochiai LR, Acosta CJ, Danovaro-Holliday MC, Baiqing D, Bhattacharya SK, et al. A study of Typhoid fever in five Asian countries: disease burden and implications for controls. *Bull World Health Organ*. 2008;86(4):260-8. PMID: 18438514
- World Health Organization. 6th International Conference on Typhoid Fever and other Salmonellosis 2006. Geneva WHO. Ref Type: Pamphlet (69kb).
- Anggraini R, Handoyo I, Aryati. DOT-EIA typhoid test using Omp Salmonella typhi local phage type antigen to support the diagnosis of typhoid fever. *Folia Medica Indonesiana* 2004;40:10-20.
- Saha SK, Baqui AH, Hanif M, Darmstadt GL, Ruhulamin M, Nagatake T, et al. Typhoid fever in Bangladesh: implications for vaccination policy. *Pediatric Infectious Disease J* 2001;20(5):521-524.
- Bhutta ZA. Salmonella. In: Kliegman RM, Jenson Hal B, Behrman RE, Stanton BF, editors. *Nelson Text book of Pediatrics*. 18th ed. Saunders Elsevier; 2007.p.1182-1190.
- Mahle WT, Levine MD. Salmonella typhi infection in children younger than five years of age. *Pediatr Infect Dis J* 1993;12:627-631.
- Bhutta ZA. Impact of age and drug resistance on mortality in typhoid fever. *Arch Dis Child* 1996; 75(3):214-217.(232kb)
- Shak I, Patankar N. Age Related Clinical and Laboratories Manifestations of Enteric Fever in Children. *JK Science* 2009;11(3):119-122.
- Ganesh R, Janakiraman L, Vasanthi T, Sathiyasekeran M. Profile of Typhoid Fever in Children from a Tertiary Care Hospital in Chennai-South India. *Indian J Pediatr* 2010;77:1089-1092.
- Rafiq H, Zia R, Naeem S. Typhoid Fever- Continues as a major threat in Children. *Biomedica* 2009;25:1-2.
- Walia M, Gaiind R, Paul P, Mehta R, Aggarwal P, Kalaivani M. Age-related clinical and microbiological characteristics of enteric fever in India *Trans R Soc Trop Med Hyg* 2006;100(10): 942-48.
- Abdel Wahab MF, el-Gindy IM, Sultan Y, el-Naby HM. Comparative study on different recent diagnostic and therapeutic regimens in acute typhoid fever. *J Egypt Public Health Assoc* 1999; 74(1-2):193-205.
- Siddiqui FJ, Rabbani F, Hasan R, Nizami SQ, Bhutta ZA. Typhoid fever in children; some epidemiological considerations from Karachi, Pakistan. *Int J Infect Dis* 2006;10:215-222.
- Tohme A, Zein E, Nasnas R. Typhoid fever. Clinical and therapeutic study in 70 patients. *J Med Liban* 2004;52(2):71-77.
- Kumar R, Gupta NS. Multidrug-resistant typhoid fever. *Indian J Pediatr* 2007;74(1):39-42.
- IAP task force report. Diagnosis of enteric fever in children. *Indian Pediatr* 2006;43:875-83.
- Malik AS, Malik RH. Typhoid fever in Malaysian children. *Med J Malaysia* 2001;56(4):478-90.
- Lefebvre N, Gning SB, Nabeth P, et al. Clinical and laboratory features of typhoid fever in Senegal. A 70-case study. *Med Trop* 2005;65(6):543-48.
- IAP task force report. Management of enteric fever in children *Indian Pediatr* 2006;43:884-7.

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