ORIGINAL ARTICLE

DIFFERENCES IN LABORATORY MANIFESTATIONS OF ENTERIC FEVER IN CHILDREN ON THE BASIS OF AGE

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ABSTRACT

Background: Very scanty literature is available on clinical and laboratory manifestations of enteric fever in children on the basis of age difference in Pakistan. A study was therefore conducted to evaluate the laboratory manifestations of enteric fever on the basis of age. **Methods:** This study was conducted in Paediatric Department Bacha Khan Medical College Mardan, from1st April 2010 to 31st March 2011. All patients presenting with fever having positive Widal test and/or positive culture for Salmonella were included. In total 36 consecutive patients were included and divided into two age groups, <5 years and >5years. The laboratory results of the two groups were compared. Recovery period and any complication in the two groups was also observed. **Results:** Mean age of presentation was 5- (5.0±3.0) years. Male to female ratio was 2:1. Common laboratory features were Anemia (88%), elevated liver enzymes (85%), and elevated ESR (80%). Leucocytosis was more common in <5 years group while gallbladder sludge on USG was seen in 4 patients and all were >5 years (p=0.04). Complications were seen in 18.18% patients; of which 33.33% had serositis, 1 (16.67%) each had osteomylitis, synovitis, splenic abscess and shock. Majority (93.9%) recovered. 1 died and 1 was lost to follow up. **Conclusion:** Common Laboratory features of enteric fever include anemia, elevated liver enzymes and elevated ESR. Leukocytosis is mainly seen in <5 years old children while gall bladder sludge in children >5 years. Recovery time is longer in >5yrs group than <5 years age.

KEY WORDS: Enteric fever, Liver enzymes, Leukocytosis, Gall bladder sludge.

INTRODUCTION

Enteric fever continues to be endemic in poor countries globally, although it has been eradicated from the developed nations due to their well-organized sanitation and protected water supply.[1,2] The five Fs most concerned with spread of typhoid disease are food, fingers, flies, fomites, and feces.[3] Enteric fever is predominantly caused by *Salmonella typhi* and next in frequency is *Salmonella paratyphi A*. It is transmitted by fecal oral route. Infected persons and healthy carriers are main sources of infections.[4]

Common clinical features of enteric fever are fever, vomiting, abdominal pain, diarrhea, cough, hepatomegaly, anemia, and thrombocytopenia.[5-8] Similar clinical presentation is also seen in dengue fever and malaria.[9]

Enteric fever is reported more frequently in children above 5 years of age and complications are seen in over 1/3rd of patients.[6,8] However in children less than 5 years of age laboratory features may differ and thus it is important to know the laboratory manifestations of typhoid fever and whether there is any difference in these on the basis of age difference.

We conducted this study to compare the laboratory profile of enteric fever in children on the basis of age.

MATERIAL AND METHODS

This descriptive study was conducted at Department of Pediatrics, Mardan Medical Complex Mardan, from 1st April 2010 to 31st March 2011.

All patients presenting with fever having positive Widal test[10,11] and/or positive culture for salmonella were included. In total of 36 consecutive patients were included and divided into two age groups <5 years and >5years. The laboratory results of the two groups were compared. Recovery period and any complication in the two groups were also observed.

Detailed history with clinical examination was undertaken in all patients. All patients underwent investigations such as complete blood picture, liver & renal functions tests, stool & urine examinations, Widal test and blood culture on admission and thereafter if the children condition warranted it. Additional investigations like echo-cardiography, chest x ray, and ultrasound of abdomen were done where indicated.

Other tests like smears for malarial parasites and dengue IgM were done to exclude other causes of fever. Common clinical and laboratory features were noted.

Statistical analysis was done on the basis of "t" test for quantitative data and chi square test for qualitative data. P value was applied to assess the probability and significance of data. P value of <0.05 was considered significant.

RESULTS

Mean age of presentation was 5 (5.0±3.0) years. Out of these, 17 (47.2%) patients were <5 years old whereas 19 (52.8%) were >5 years of age. Male to female ratio was 2:1. (Table 1)

On diagnosis, 30 (83.4%) patients had positive Widal test, 6 (16.6%) patients positive blood cultures. Four patients had both Widal and blood cultures positive.

In <5 years age group leucocytosis was more common and in >5 years age group gall bladder sludge was more common. Other parameters showed no significant difference in the two groups. The various laboratory parameters between the two groups are shown in Table 2.

Children in <5 years of age group recovered much faster than those in >5 years age group (mean 6.1±2.1days vs 9.4±4.5 respectively (p value =0.01).

Complications were seen in 6 (18.18%) patients of which 23.33% had serositis and 1 each had osteomylitis, synovitis, and splenic abscess, shock. 1 patient died and1 has lost to follow up and remaining all recovered completely.

DISCUSSION

Very little data is available on age related laboratory manifestation in children with only one study from Walia et al.[5] In most of the studies children with enteric fever were more than 5 years of age at the time of presentation,[5,6,12] with children less than 5 years ranging 22.5% to 24.8%). In our study children less than 5 years constituted 47.2% of the total patients with enteric fever, which may be due to poor hygiene condition and under nutrition below 5 years of age.

In our study males were more commonly affected as compared to females which is in accordance with the studies conducted by Gupta (1994), Basit (1996), Saqib 2000 & Husain et al(2002).[13] Whereas Abdel Wahab et al found equal distribution between boys and girls.[7]

Elevated Liver enzymes, anemia, elevated ESR were the most common laboratory features of enteric fever in children in our study similar to that reported by Malik et al[6] and others.[8,14,15]

Leucopenia was also not commonly seen similar to that reported by Lefebvre et al.[16]

Table 1: Gender distribution of patients in two groups (n=36).

	<5 years		>5 years		
Sex	**Total no.**	**%age**	**Sex**	**Total no.**	**%age**
Males	12	70.59	Males	12	63.16
Females	05	29.41	Females	07	36.84

Table 2: Age related laboratory Parameters

Lab Parameters	***< 5 years***	***> 5 years***	***P value***
Anemia	15 (51.72%)	14 (48.28%)	0.31
Neutropenia	1 (50%)	1 (50%)	0.96
Neutrophilia	8 (66.67%)	4 (33.33%)	0.11
Leucopenia	2 (66.67%)	1 (33.33%)	0.50
Leucocytosis	9 (64.29%)	5 (35.71%)	**0.05**
Thrombocytopenia	5 (45.46%)	6 (54.54%)	0.80
Elevated ESR	10 (50%)	10 (50%)	0.68
Elevated SGPT	10 (45.46%)	12 (54.54%)	0.86
Widal positive	14 (50%)	14 (50%)	0.68
Blood culture positive	4 (50%)	4 (50%)	0.92
Gall bladder sludge	0	4 (100%)	**0.04**

In <5 years age group leucocytosis was more common, while gall bladder sludge was seen in 13.8% of patients in only >5yrs age group. This is similar to that reported by Mateen et al.[17] Other laboratory parameters showed no significant difference. It can be concluded from the study that gall blader sludge on VSG has some place in the diagnosis of enteric fever in children >5yrs, but as the sample size as small, further studies are needed.

Blood culture was positive in one quarter of our cases. Only one multidrug resistant case was observed.

Complications of enteric fever were seen in 18.18% of patients which is less than those reported in other studies, where complications have been seen in over 30% of patients.[6,8,15] Common complications of enteric fever that have been reported are bone marrow suppression, paralytic illus,[6,12] other GI complications[8,16] pneumonia,[12] cholecystitis, endocarditis, osteomylitis, CNS complications and splenic abscess.[18-20] In our study the complications observed were pleural effusion, splenic abscess, and osteomylitis, synovitis and shock. Mortality was minimal, in our study as has been reported by other studies.[14,16]

CONCLUSION

Common Laboratory features of enteric fever include elevated liver enzymes, elevated ESR and anemia. Leukocytosis is mainly seen in <5 years old children while gall bladder sludge in children >5 years.

Recovery time is longer in >5yrs group than <5 years age.

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