

A study on Demographic Characteristics and Hematological Profile (CBC) of the Patients with Typhoid Fever.

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Abstract:

Introduction: The hematological and demographical changes due to multi-organ involvement in typhoid fever are not uncommon and they are also related with each other's. The objective of this study was to find out the frequency and brutality of the above changes in adult patients admitted to the hospital because of typhoid fever.

Material & Methods: This was a cross sectional study conducted in the Department of Paediatrics, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka Medical College Hospital (DMCH) and, SSMCH – Sir Salimullah Medical College Hospital (SSMCH), Dhaka for a period of one year from July 2015 to June 2016. A total number of 100 children with typhoid fever were studied and diagnosed were based on clinical features, Widal test and blood culture.

Results: Out of 100 patients 60% were probable case and 40% were confirmed case of typhoid fever. Homogenous distribution of cases amongst the three age groups with a male to female ratio of 1.5:1. The gender distribution of the studied participant, where the 40% female and 60% male were detected. Mostly (86%) of the children had abatement of fever < 5 days while 58.1% children achieved normal liver span between 3-5 days of treatment and mortality was 0%.

Conclusion: The study concluded that clinical pattern of typhoid fever conforms well to that of known pattern of the disease in children. Blood culture profile shows widespread emergence of nalidixic acid related resistant strains and the sporadic occurrence of cephalosporin resistant strains of hematological changes. Determinations should be taken to find the hematological changes of typhoid fever before starting treatment

Key Words: Personal Hygiene Practice, Typhoid Fever, Hematological, Demographical, Leukocyte Count.

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I. Introduction

Typhoid fever is complete infectious infection instigated by Salmonella Typhi, a gram harmful dowels. The infection is usually acquired through the ingestion of water or food polluted by the urine or feces of infected transferors¹. Typhoid fever establishes a major public health issues in many developing countries of the world and it has also been gradually reported from the developed countries². Typhoid fever mostly disturbs children and young grownups and it is renowned as a major cause of disease globally. Hematological imbalances are mutual in typhoid fever³, whereas, clinically significant renal disease in typhoid fever is an uncommon event, occurring in 0-6% of all patients.⁴ despite the use of antibiotics and the development of newer antimicrobial agents, Typhoid fever continues to be a major public health problem causing high morbidity and mortality in developing countries⁵. Diagnosis of typhoid fever is fraught with problems. History, physical findings and fever pattern are suggestive but can neither confirm nor exclude typhoid. Blood culture is the 'gold standard' for diagnosis and also gives information about antibiotic sensitivity of the isolates; however low positive culture rate, its cost, lack of "culture of cultures" and administration of prior antibiotics are impediments in this diagnostic approach. Widespread and indiscriminate use of antimicrobials contributes to the development of some unusual or atypical presentations of typhoid fever and changes in the antibiotics resistance pattern in

endemic countries like Bangladesh. Due to the development of multidrug resistance, typhoid fever is becoming increasingly difficult to diagnose and treat. There is a scarcity of studies and recent publications addressing these issues from our community where the problem is more common. Hence, this study was planned to see the Demographic Characteristics and Hematological Profile (CBC) of the patients with typhoid fever. This study was undertaken to determine the demographic characteristics and Hematological Profile (CBC). Thus, this may help in developing appropriate strategies for the management of typhoid fever.

II. Objectives

a) General objective:

- To determine the Demographic Characteristics and Hematological Profile (CBC) of the patients with typhoid fever,

b) Specific Objectives:

- To measure the Demographic characteristics of the patients with typhoid fever.
- To observe Hematological profile (CBC) of the patients with typhoid fever

III. Methodology And Materials

This was a Cross-sectional observational study. The study was carried out under the department of Pediatrics of Bangabandhu Sheikh Mujib (BSMMU) Medical University, Dhaka Medical College Hospital (DMCH) and Sir Salimullah Medical College Hospital (SSMCH). From these areas 75, 10 and 15 cases were selected respectively. In the above centers, a lot of pediatric patients with typhoid fever are admitted every year for evaluation and management. Overall, period of study was July 2015 to June 2016 (One year). Ethical clearance was taken from Institutional Review Board (IRB) of BSMMU and the participants were explained that there will be no physical or social risk. The Children admitted in the Pediatrics wards of the above mentioned hospital during the study period with suspected diagnosis of typhoid fever were the study population. Children with positive blood culture were diagnosed as 'confirm case' and cases with a titer of TO \geq 1:160 or rising titer of Wedel test were diagnosed as 'probable case'. All children with diagnosis of 'confirmed' or 'probable cases' admitted in those hospital during the study period were the sample. During the study period febrile patients admitted in above mentioned hospital with the diagnosis of suspected typhoid fever was screened. Suspicion was made on the basis of clinical features like continued fever, toxic look, diarrhea/constipation, splenomegaly, hepatomegaly, diffuse tenderness and caecal gurgling. Clinically suspected cases undergone laboratory investigation that includes CBC, Widal test and blood culture and other tests as per individual case merits. To determine the sample size, the following formula 100 children with the diagnosis of typhoid fever and fulfilling the inclusion and exclusion criteria's during the study period were selected purposively.

Inclusion Criteria

- Patient diagnosed as typhoid fever and admitted in mentioned hospitals during the study period.
- Pediatric age group of both sexes

Exclusion Criteria

- Patient with severe co-morbidities unrelated to typhoid fever.
- Patient with paratyphoid fever.
- Care-giver not willing to give written consent

IV. Results

A total number of 100 children were taken for the study. (Figure I) showed, out of 100 patients 60% were probable case and 40% were confirmed case of typhoid fever. (Table I) showed homogenous distribution of cases amongst the three age groups with a male to female ratio of 1.5:1. (Figure II) Pie chart shows the gender distribution of the studied participant, where the 40% female and 60 % male were detected. (Table II) showed most (86%) of the children had abatement of fever < 5 days while 58.1% children achieved normal liver span between 3-5 days of treatment and mortality was 0%.

Figure I: Distribution of typhoid patient according to case definition (n=100).

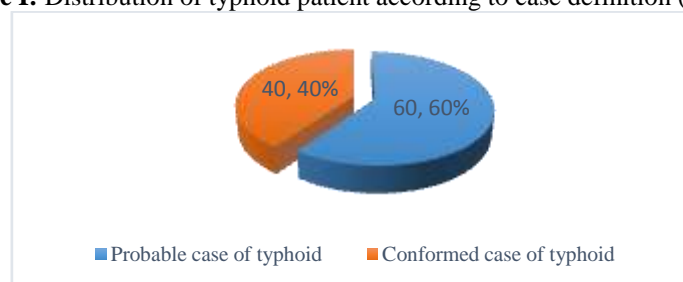


Table I: Demographic characteristics of children with typhoid fever (n=100).

Demographic characteristics	Number of children	%
Age 1-5 year	37	37
5-10 year	35	35
>10 year	28	28
Sex		
Male	60	60
Female	40	40
Monthly family income		
≤10000	16	16
10001 – 20000	28	28
20001 – 30000	30	30
≥30001	26	26

Figure II: Pie chart shows the gender distribution of the studied participant.(n=100)

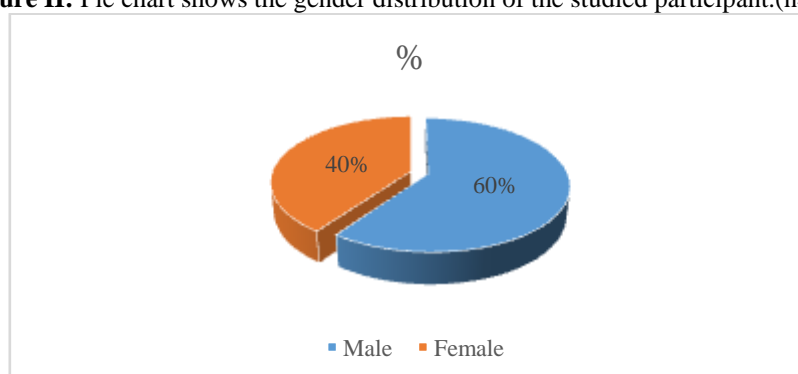


Table-II: Hematological profile in children with typhoid fever (n=100).

Hematological profile	Number of children	%
Leukocyte count		
Leukopenia	3	3
Normal leukocyte count	87	87
Leukocytosis	10	10
Eosinophil count		
Absolute eosinopenia	21	21
Normal eosinophil count	79	79
Eosinophilia	0	0

V. Discussion

The present study showed male preponderance 1.5:1. This is consistent with the result of Kumar et al., (2008)⁶ and Abdullah et al., (2012)⁷. However, other report suggests similar prevalence amongst both sexes (Shah et al., 2014)⁸. Probable explanation might be that in a male dominant society like our male child has higher access to medical care. It may also be due to the fact that the male children are more independent and has more chance of exposure to street food. Many studies showed higher prevalence amongst poor socioeconomic background. But in the present study the distribution was quite even in all three economic categories. This may suggest that the division was inappropriate or the availability of safe water or exposure to contaminated food

was wide and rampant. Thrombocytopenia and subclinical disseminated intravascular coagulation (DIC) occur commonly in typhoid fever. Hemolysis may occur in hemolytic uraemic syndrome (HUS) and glucose-6-phosphate dehydrogenase (G6PD) deficiency. Immune complex glomerulonephritis has been reported. Nephritic syndrome may complicate *S. typhibacteremia* associated with urinary schistosomiasis (Girgis et al., 1999)⁹. Pyelitis and cystitis may also develop. Arthritis and osteomyelitis may be common in sickle cell anaemia. Typhoid thyroiditis has recently been reported (Fey et al., 2000)¹⁰. In our study maximum children had (87%) normal leukocyte count followed by 10% had leukocytosis and rest 3% had leucopenia. Ramaswamy Ganesh et al. (2010)¹¹ in their study found that, most of the children had normal leukocyte count and leucocytosis (12%) were more common than leucopenia (8%). The reason might be leukocytosis is more common than leukopenia in children or it might be associated with secondary bacterial infection. Absolute eosinopenia was found in 21(21%) patient and rest 79 (79%) patient had normal eosinophil count. Ramaswamy Ganesh et al. (2010)¹¹ in their observation found that eosinopenia was seen in 72 %. Blood culture was positive in 40 children and yield was 48.78%. This finding is similar to the findings of Farooqui et al. (1991)¹². This high yield of culture may be due to the fact that many of the patients in our study was brought to the hospital in the first week, and those who were not treated previously with Amoxicillin, cotrimoxazole and chloramphenicol.

LIMITATIONS OF THE STUDY

This was a Cross-sectional observational study with small sample size, which doesn't reflect the scenario of the whole country.

VI. Conclusion And Recommendations

In conclusion, typhoid fever causes significant hematological changes as well as Demographic Characteristics. However, the Medical profile of typhoid fever in children admitted in tertiary care hospitals matches to what had been seen in the past and recorded in texts. Demographic characteristics, including age, sex, BMI, monthly family income, personal hygiene, type of sanitation, source of drinking water and feeding habit were recorded for the study and Clinical profile including history and physical examination findings and hematological profile including total and differential count of WBC, Widal and blood culture results were judged. Recommendations: Determinations should be taken to find the hematological changes of typhoid fever before starting treatment. Continuous surveillance of typhoid fever and drug sensitivity pattern may be initiated. Civic leaning study may be done to know the disease in regular basis.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

References

- [1]. James M. Typhoid fever. JAMC 2003; 169(2):132.
- [2]. Stormaon MO, McIntyre PB, Morris J, Fasher B. Typhoid fever in children: diagnosis and therapeutic difficulties. *Pediatr Infect Dis J* 1997; 16:713-4.
- [3]. Khosla SN, Anad A, Singh U. Hematological profile in Typhoid fever. *Tropical Doctor* 1995; 25:156-8.
- [4]. Van den Bergh ET, Gasem MH, Keuter M. Out come in three groups of patients with typhoid fever in Indonesia in between 1948 and 1990. *Trop Med Int Health* 1999; 4:211-15.
- [5]. Arora D, Singh R, Kaur M, Ahi RS 2010, 'A changing pattern in antimicrobial susceptibility of *Salmonella enterica* serotype isolated in north India'. *Afr J Microbiol Re*; vol. 4, pp. 197-203.
- [6]. Kumar S, Rizvit M, and Berry N. 2008, Rising prevalence of enteric fever due to multidrug resistant salmonella: an epidemiological study. *J. Of medical microbiology*; vol. 57, pp. 1247- 50.
- [7]. Abdullah FE, Haider F, Fatima K, Irfan S, and Iqbal MS 2012, Enteric Fever in Karachi: Current Antibiotic Susceptibility of *Salmonellae* Isolates. *Journal of the College of Physicians and Surgeons Pakistan*; vol. 22, pp. 147-150
- [8]. Saha SK, Talukder SY, Islam M, Saha S 1999, A highly ceftriaxone resistant *Salmonella typhi* in Bangladesh. *Pediatr Infect Dis J*; vol.18, pp. 387.
- [9]. Girgis NI., Butler T., Frenk RW., Sultan Y., Forrest MB., Treble D., et al.1999, "Azithromycin versus Ciprofloxacin for the treatment of uncomplicated typhoid fever in a randomized trial in Egypt that included patients with multi drug resistance" *Antimicro Agents Chemotherapy*; vol. 43, pp. 1441-44.
- [10]. Fey PD, Safranek TJ, Rupp ME, Dunne EF, Ribot E, Iwen PC et al. 2000, Ceftriaxone resistant salmonella infection acquired by a child from cattle. *Thenew England journal of medicine*; vol. 342, pp. 1243-9.
- [11]. Ganesh R, Janakiraman L, Vasanthi T, Sathiyasekeran M 2010 'Profile of Typhoid fever in Children from a tertiary care hospital in Chennai – South India'. *Indian J Pediatr*; vol. 77, pp. 1089-92.
- [12]. Farooqui BJ. Khurshid M, Ashfaq MK, Khan AM 1991, Comparative yield of *Salmonella typhi* from blood and bone marrow culture in patients with fever of unknown origin. *J ClinPathol*; vol. 44, pp. 258-9.

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