

Socio-Demographic Factors Affecting the Prevalence of Enteric Fever: A Study in a Tertiary Care Hospital, Dhaka, Bangladesh

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Abstract

Original Research Article

Introduction: Enteric (Typhoid) fever is a bacterial infection which can spread all over the body, affecting several organs. The lack of proper treatment can cause serious complications and can be fatal. It is mainly caused by a bacterium called *Salmonella enterica* serovar Typhi which is related to the bacteria that cause salmonella food poisoning. It is a major public health issue in developing and developed countries. **Aim of the study:** To assess the prevalence of Enteric fever which are affecting by socio-demographic factors. **Material & Methods:** This was an observational study which was conducted at the Department of Paediatric Infectious Diseases and Community Paediatrics, Bangladesh Institute of Child Health (BICH), Dhaka Shishu (Children) Hospital, Dhaka, Bangladesh. The study was conducted from January 2018 to December 2018. Total 133 cases were selected using random sampling technique. Informed written consent was obtained from each patient before the procedure. A pre-designed questioner had been used to collect all the necessary data from the participants. Program MS-Excel was used in collecting data, SPSS version 21 was used in analyzing data. On the other hand, several tables were used to disseminate data. Following was the inclusion and exclusion criteria of the present study. **Results:** Of the total 133 study subjects, 60.2% were aged <60 months, and the rest 39.8% were aged ≥60 months; Mean age (Mean±SD) in months were 55.26±36.20; age range were 7-172 months. Male subjects were 71 (53.4%) and female subjects were 62 (46.6%); male to female ratio was 1.1: 1. Among the total study subjects, 116 (87.2%) were from urban area, 4 (3%) were from urban slum area and the rest 13 (9.8%) were from rural area. Distribution of mother's education reflects that, majority (41.4%) of the mothers were educated up to class 10, 29(21.8%) were graduated and only 9% were post graduated. Monthly income of the family reflects that, majority (43.6%) of the family's income per month was >30000tk, 38(28.6%) was between 15000-30000tk and the rest 37(27.8%) were <15000tk. The distribution of the study subjects by drinking water that demonstrates majority (50.4%) of the patients drink tap water, 21(15.8%) drink tube well water and others were 45(33.8%). Distribution of the study subjects by boiling of drinking water shows, majority (78.9%) were drinking boiled water and 28(21.1%) were not. Distribution of the study subjects by hand washing is shown which describe that, 24(18%) had the habit of washing hand before meal, 13(9.8%) had the habit of washing hand after toilet and 96(72.2%) had both the habit. **Conclusion:** In this study, it is observed that, socio-demographic factors such as age, sex, place of living and sources of domestic water play vital role in prevalence of Enteric fever.

Keywords: Enteric fever, Typhoid, Paediatrics, socio-demographic factors.

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INTRODUCTION

Enteric (Typhoid) fever is a bacterial infection which can spread all over the body, affecting several organs. The lack of proper treatment can cause serious complications and can be fatal. It is mainly caused by a bacterium called *Salmonella enterica serovar Typhi* which is related to the bacteria that cause salmonella food poisoning. It is a major public health issue in developing and developed countries. Approximately, 21.6 million people suffer from this disease, and it occurs almost 216,500 deaths every year [1, 2]. Nearly 80% of the suffering and death cases were reported from Asia, whereas the rest (20%) of them were from Africa and Latin America [2]. In South Asia, it is assessed that approximately 400 million people (23% of the population) subsists in high-risk situations for aquatic diseases³. It is determined that Enteric fever is most seen in parts of the world that have poor sanitation and limited access to clean water. Although, people of various age are being affected, but children are considered to be most at risk of developing typhoid fever. This may be for the reason that their immune system is still developing. But children with typhoid fever tend to have milder symptoms than adults. Some recent evidence from Delhi has specified that the prevalence of affected by typhoid fever is significantly superior in preschool children [4]. Higher morbidities as well as occurrence of multidrug-resistant isolates has made effective therapy of typhoid very challenging as first-line drugs are dropping their effectiveness against the organism [5]. There is also substantial epidemiological interest in the seasonal difference of pediatric typhoid fever. The effect of climatic factors is considerable and prophylactic actions for the summer months are encouraged [6, 7]. Despite the fact that, the major cause of *Salmonella enterica serovar Typhi* infection is through contaminated food and water, a considerable number of causes add to disease burden in endemic settings [8]. Such factors are poor sanitation, contact with carriers, living near bodies of stagnant water, climatic conditions, and socioeconomic contexts (eg, literacy rates, food and water consumption patterns) [9, 10]. In short, low socio-economic status and poor hygiene conditions [1, 11] are responsible for the spread of the infection [12, 13]. Therefore, this study aims to observe the socio-demographic factors that affects the prevalence of Enteric fever.

METHODOLOGY AND MATERIALS

This was an observational study which was conducted at the Department of Paediatric Infectious Diseases and Community Paediatrics, Bangladesh Institute of Child Health (BICH), Dhaka Shishu (Children) Hospital, Dhaka, Bangladesh. The study was conducted from January 2018 to December 2018. The

aim of the study was to assess the prevalence of Enteric fever which are affecting by socio-demographic factors. Total 133 cases were selected using random sampling technique. Informed written consent was obtained from each patient before the procedure. A pre-designed questioner had been used to collect all the necessary data from the participants. Program MS-Excel was used in collecting data, SPSS version 21 was used in analyzing data. On the other hand, several tables were used to disseminate data. Following was the inclusion and exclusion criteria of the present study.

Inclusion Criteria

- Patients admitted at at the Department of Paediatric Infectious Diseases and Community Paediatrics, Bangladesh Institute of Child Health (BICH), Dhaka Shishu (Children) Hospital, Dhaka, Bangladesh
- Patient aged below 16 years

Exclusion Criteria

- Patients aged above 16 years

RESULTS

Of the total 133 study subjects, 60.2% were aged <60 months, and the rest 39.8% were aged ≥60 months; Mean age (Mean±SD) in months were 55.26±36.20; age range were 7-172 months. Male subjects were 71 (53.4%) and female subjects were 62 (46.6%); male to female ratio was 1.1: 1. Of the total study subjects, 116 (87.2%) were from urban area, 4 (3%) were from urban slum area and the rest 13 (9.8%) were from rural area. Distribution of mother's education reflects that, majority (41.4%) of the mothers were educated up to class 10, 29(21.8%) were graduated and only 9% were post graduated. Monthly income of the family shown in the last part of Table-1 reflects that, majority (43.6%) of the family's income per month was >30000tk, 38(28.6%) was between 15000-30000tk and the rest 37(27.8%) were <15000tk. Table-2 shows the distribution of the study subjects by drinking water that demonstrates majority (50.4%) of the patients drink tap water, 21(15.8%) drink tube well water and others were 45(33.8%). Distribution of the study subjects by boiling of drinking water (Table-3) shows, majority (78.9%) were drinking boiled water and 28(21.1%) were not. In Table-4 distribution of the study subjects by hand washing is shown which describe that, 24(18%) had the habit of washing hand before meal, 13(9.8%) had the habit of washing hand after toilet and 96(72.2%) had both the habit. Distribution of the study subjects by hand washing after defecation with, and distribution of the study subjects by H/O typhoid vaccination is shown in Table 5 and 6 respectively.

Table-1: Demographic characteristics of the study subjects (n=133)

Demographic characteristics	Frequency	Percentage (%)
Age (in months)		
< 60	80	60.2
≥ 60	53	39.8
Total	133	100.0
Mean±SD	55.26±36.20	
Range	(7 – 172) months	
Sex		
Male	71	53.4
Female	62	46.6
Male : Female ratio	1.1 : 1	
Residence		
Urban	116	87.2
Urban slum	4	3.0
Rural	13	9.8
Mother's education		
Class 1-10	55	41.4
SSC	15	11.3
HSC	22	16.5
Graduate	29	21.8
Post graduate	12	9.0
Total	133	100.0
Monthly income (Tk.)		
<15000	37	27.8
15000-30000	38	28.6
>30000	58	43.6
Total	133	100.0

Table-2: Distribution of the study subjects by drinking water (n=133)

Drinking water	Frequency	Percentage (%)
Tap water	67	50.4
Tube well	21	15.8
Others	45	33.8
Total	133	100.0

Table-3: Distribution of the study subjects by boiling of drinking water (n=133)

Boiling of drinking water	Frequency	Percentage (%)
Yes	105	78.9
No	28	21.1
Total	133	100.0

Table-4: Distribution of the study subjects by hand washing (n=133)

Hand washing	Frequency	Percentage (%)
Before meal	24	18.0
After toilet	13	9.8
Both	96	72.2
Total	133	100.0

Table-5: Distribution of the study subjects by hand washing after defecation with (n=133)

Hand washing after defecation	Frequency	Percentage (%)
Soap	124	93.2
Ash	4	3.0
Only water	5	3.8
Total	133	100.0

Table-6: Distribution of the study subjects by H/O typhoid vaccination (n=133)

H/O of vaccination	Frequency	Percentage (%)
Yes	15	11.3
No	118	88.7
Total	133	100.0

DISCUSSION

In the present study, of the total 133 study subjects, 60.2% were aged <60 months, and the rest 39.8% were aged ≥60 months. Chandrasekhar *et al.*, [14] in their study showed that 60% of typhoid patients were above 5 years of age which is almost similar to our study. Another study from a Tertiary care hospital in Chennai, South India showed that 169 (53.48%) out of 316 cases of typhoid fever were > 5 years of age [15]. Also, there were a total of the 14 studies that included to analyze the children under-5 age group, where 3 studies [16-18] estimated that <15% of disease was in this age group, whereas 3 studies [19-21] estimated that more than half the disease occurrence was in this age group. In our study male subjects were 71 (53.4%) and female subjects were 62 (46.6%); male to female ratio was 1.1: 1. Two different studies by Oboegbulam *et al.*, [22] and Agbakwuru *et al.*, [23] showed that typhoid fever is more prevalent in males than females. Meanwhile, Zailani *et al.*, [24] found no influence of age, sex and social class on the distribution pattern of *Salmonella enterica serovar Typhi* and *Salmonella enterica serovar Paratyphi* in Ile-Ife, south western Nigeria. Majority (50.4%) of our study participants drink tap water, 21(15.8%) drink tube well water and others were 45(33.8%). Distribution of the study subjects by boiling of drinking water also showed, majority (78.9%) were drinking boiled water and 28(21.1%) were not. Even though, a straight link between well water and typhoid fever infection may be challenging to inaugurate, probable contamination of most well water might be a most important influential aspect to the high infection frequency [25]. A survey showed that most of the wells are dug close to the soak away and septic tanks and this must have exhilarated the seepage of human waste which is a verified means of spread of the infection agent into the water source [26]. Even though studies reported that there is no noteworthy difference on the incidence of typhoid between urban and rural environments [27], in this study urban residents were associated with higher risk of typhoid fever as compared to rural residents. This could be explained by suboptimal access to safe water and lack of hygienic environment in the rural areas of Bangladesh. In addition, this study was conducted in a tertiary care hospital which is situated in the urban area. So this might be another reason behind observing the superior proportion of people getting affected by Enteric fever in urban area than rural area.

LIMITATIONS OF THE STUDY

This was an observational study conducted in a single centered unit. The sample size was comparatively

small. So, it might not reflect the scenario of the whole country.

CONCLUSION AND RECOMMENDATIONS

In this study, it is observed that, socio-demographic factors such as age, sex, place of living and sources of domestic water play vital role in prevalence of Enteric fever. It is concluded that, campaigns by the Government and policy makers on the importance of hygiene should be take place among the urban and rural area to educate general people. Furthermore, public health agencies should base plans to control the disease. Moreover, awareness should be spread through media such as television and newspapers.

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