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Original Article

EPIDEMIOLOGICAL PROFILE OF ENTERIC FEVER CASES ADMITTED IN SCSMGH, SOLAPUR

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ABSTRACT

Enteric fever, though occurs in all parts of the world, is a serious public - health problem in developing countries. It is one of the important cause of morbidity in India due to high rates of complications and hospitalization. This disease mainly affects the older children and young adults. So it's important to know the socio-demographic and other epidemiologic factors of the disease. The study was conducted with objectives to study socio-demographic and some of the epidemiologic features of enteric fever cases and also to study duration of hospital stay, outcome and mortality among enteric fever cases. A hospital based cross-sectional descriptive study was conducted in Solapur City from January 2002 to December 2002. All proved cases of enteric fever admitted in medicine and pediatric ward of SCSMGH, Solapur were the study subjects. There were total 172 cases of enteric fever admitted during this period. Out of 172 enteric fever cases, majority (40.70%) were in the age group between 11-20 years. Males outnumbered the females giving M:F ratio of 1.6:1. A significant association was found between literacy status, socioeconomic status, levels of personal hygiene and occurrence of enteric fever. The overall duration of hospital stay ranged from 2 to 35 days with mean 7.91 days and S.D. 5.45 days. Fatality rate observed in this study was 1.74%. Thus present study found majority of patients in 11-20 years (school children and adolescents) age group. There was significant association of literacy status, socioeconomic status and personal hygiene with development of enteric fever.

Key words: -Enteric fever, Personal hygiene, Duration of hospital stay, Outcome

INTRODUCTION

Enteric fever though occurs in all parts of the world, is a serious public - health problem in developing countries. The disease has been virtually eliminated from the industrialized world because of the provisioning of clean water and good sewage systems. But the under - developed and the developing countries continues to face the brunt. According to an estimate of US Centers for Disease Control and Prevention, there are 21.6 million typhoid cases annually, with the annual incidence varying from 100 to 1000 cases per 100,000 populations. The incidence is highest in the age group of 5 - 19 years but population based studies from South Asia suggest that the incidence is highest in children aged less than 5 years, with higher rates of complications and hospitalization. Enteric fevers are not notifiable diseases throughout India and hence the correct incidence is not known. Limited studies in the country reveal more than three lac cases and more than 650 deaths (approx.) annually in our country[1]. 1% of children between 0-17 yrs suffer per year. In year 2005 there were 6, 53,580

enteric fever cases & 417 deaths[2]. Resistant to antibiotics is one of the serious obstacles in control of enteric fever. Its danger doesn't end when symptoms disappear as patient may turn into carrier state which may be a chronic one in which condition the person is excreting the bacilli for several years[3].

OBJECTIVES

i) To study sociodemographic and some of the epidemiologic features of enteric fever cases
ii) To study duration of hospital stay, outcome and mortality among enteric fever cases.

MATERIALS AND METHODS

A hospital based cross-sectional descriptive study was conducted in Solapur City to study epidemiological features of enteric fever cases, from January 2002 to December 2002 after obtaining ethical Committee clearance.

Selection of cases: All proved cases of enteric fever admitted in medicine and pediatric ward of SCSMGH, Solapur were the study subjects. The cases of enteric fever treated on OPD basis were not included in this study. There were total 172 cases of enteric fever admitted during this period. The information was collected in a predesigned and pretested proforma which included sociodemographic data, duration of stay, family background, outcome etc. The interviews of 1

the patients and their relatives (in case of children below 12 years) taken at the time of hospital visit and at time of discharge after taking their informed consent.

Some definitions used in the study

1) **Criteria for labeling the case as an enteric fever**

i) Suggestive clinical picture &
ii) Blood culture positive for Salmonella typhi and/ or Salmonella paratyphi organisms. &/or
iii) Widal test +ve as per following criteria[3, 4]
a) Titre of TO 1: 100 or more and/or TH 1: 200 or more.
b) A rise in titre which is atleast four fold.

2) Education[2, 5]

Illiterate – A person who could not read or write. This category also included those who could only sign or reproduce some writing mechanically without any meaning.

Literate – Those who had taken formal education. This category was further subdivided into Primary, High school, S.S.C., H.S.C, Graduate and above. This category also included those who could read or write with meaning but had not taken any formal education in school and were included in Primary group of education. The children below 7 years were not considered while taking education history. In this study, there were 7 children below 7 years of age who were excluded while considering literacy status.

3) Socioeconomic status[6, 7, 8]

Socioeconomic status as suggested by B.G. Prasad was adopted and modified as per All India Consumer Price Index (AICPI) of 1st March 2002.

4) Duration of hospital stay- time interval between date of admission and discharge and was grouped as- < 7 days, 7-13 days, 14-28 days, > 28 days.

5) Personal hygiene[2] - includes daily bathing, clothing, washing hands with soap and water before meals and after toilet, care of nails and feet, care of teeth (oral hygiene), spitting, coughing, sneezing, sleep and personal appearance. Personal hygiene was graded as – Good- if 7-10 factors present., Average – if 3-6 factors present., Poor- if < 3 factors present

6) Environmental history

i) Type of house[9] - Kaccha / Pacca
ii) Overcrowding[2] -as per persons per room criteria
iii) Storage of drinking water- hygienic/ unhygienic
iv) Storage of cooked food[10] - hygienic/ unhygienic
v) Method of waste disposal- sanitary / insanitary

7) Outcome of patient was recorded as recovery and discharge, absconded, discharge against medical advice and death.

RESULTS

Total no. of proved enteric fever cases admitted during the study period were 172. Age wise distribution showed that maximum no. of patients i.e.70 (40.70%) were in 11-20 years age group. More than two third of patients i.e.118 (68.60%) were 0-20 years age group (i.e. children and adolescents). Out of 172 cases, 107(62.21%)

patients were males and 65(37.79%) were females. Male to female ratio was 1.6: 1.

Area wise distribution of cases showed that 92(53.48%) patients were from rural area and 80(46.52%) were from urban area. Religion wise distribution showed that majority of the patients 105(61.04%) were Hindus, 44(25.58%) were Muslims and 23(13.38%) belonged to other religions like Christians, Jain etc.

Table 1: Distribution of cases according to educational status

Educational status	No. of patients (%)
Illiterate	82(49.70)
Primary	25(15.15)
High school	22(13.33)
S.S.C.	15(9.09)
Higher secondary school	11(6.67)
Graduate and higher	10(6.06)
Total	165*(100.00)

*x^2=28.04, df=4,p< 0.001(*highly significant*)*
**- 7 children were below 7 years of age so were not considered when analyzing literacy status.*

Distribution of literacy status and enteric fever cases (Table no.1) showed that as literacy status increased, risk of getting enteric fever infection decreased and was found statistically significant.

Table 2: Levels of personal hygiene and enteric fever

Levels of personal hygiene	Total No (%)
Good	12 (6.98)
Average	47 (27.32)
Poor	113 (65.70)
Total	172 (100.00)

*x^2=91.76, df=2,p< 0.001(*highly significant*)*

Distribution of cases according to socioeconomic status showed that out of 172 cases, more than half patients 94(54.65%) were from class IV(upper lower) socioeconomic status followed by V(lower lower)47(27.33%) according to modified B.G. Prasad classification. Only 1.16% patients belonged to class I (upper) socioeconomic status. When class IV and V were pooled as lower socioeconomic status and class I,II and III as upper and middle socioeconomic status, a significant association was found between socioeconomic status and enteric fever.(*x^2 =70.348, df=2,p< 0.001*)

Out of 172 respondents, (Table no. 2) 2/3rd 113(65.70%) patients had poor personal hygiene and only 12(6.98%) had good hygiene. As standard of personal hygiene were increased , there were less chances of enteric fever disease and was found statistically significant(p<0.001).

Table 3: Distribution of cases according to housing conditions

Housing condition	Patients (%)
1) Type of house	
Kaccha	137(79.65)
Pacca	35(20.35)
2) Storage of drinking water	
Unhygienic	124(72.09)
Hygienic	48(27.91)
3) Storage of cooked food	
Unhygienic	94(54.65)
Hygienic	78(45.35)
4) Overcrowding	
Present	121(70.35)
Absent	51(29.65)
5) Waste disposal	
Insanitary	117(68.02)
Sanitary	55(31.98)
Total	172(100.00)

The distribution of enteric fever patients according to housing conditions (Table no.3) showed that majority 137(79.65%)had Kaccha house. Around 3/4th of the cases 124(72.09%) had unhygienic way of storage of drinking water. Out of 172 cases, more than half of patients 94(54.65%) had unhygienic way of storage of food. Overcrowding was present in 121(70.35%) cases and insanitary way of waste disposal was present in 117(68.02%) of cases.

Table 4: Distribution of cases according to duration of hospital stay

Duration of hospital stay	Patients (%)
< 7 days	84(48.84)
7 to 13 days	68(39.53)
14 to 28 days	18(10.47)
>28 days	2(1.16)
Total	172(100.00)
Mean± S.D.	7.91± 5.45

The mean duration of hospital stay for enteric fever patient (Table no.4) was 7.91 with Standard Deviation 5.45 days and range was 2-35 days.

Out of 172 respondents, 151(87.79%) were responded very well to treatment and recovered. However 7(4.07%) patients absconded and 11(6.40%) were given discharge against medical advice. Their status about the

disease outcome could not be assessed. Three patients were died giving fatality rate of 1.74%.

DISCUSSION

Out of 172 enteric fever cases, majority (40.70%) were in the age group between 11-20 years. The possible causes for enteric fever being common in this age group include their mobility, consumption of unhygienic food and water in schools and colleges. These observations were consistent with various studies[11, 12]

Males outnumbered the females giving M:F ratio of 1.6:1.This might be due to our cultural background where male is more likely to report to hospital, at same time more likely to contract infection outside the house. This finding was comparable with the studies of S.C. Sood and P.N. Taneja[13] and S.N. Khosla et al[14].

Among 172 patients, 49.70% were illiterate and 50.30% were literate. A significant association was found between literacy status and occurrence of enteric fever ($p< 0.001$). Enteric fever was more common among illiterate and low educational status people as is usually associated with ignorance, poverty and poor personal hygiene. This observation was consistent with study done by S.Bhatti et al[15].

The present study found a significant association between socioeconomic status and enteric fever ($p<0.001$). Several studies[13, 15, 16] also support the finding that enteric fever was more common in lower socioeconomic group. The low socioeconomic status usually goes parallel with poor standard of living and poor personal hygiene making persons more prone for enteric fever.

Around 2/3rd of cases (65.70%) had poor personal hygiene. As standards of personal hygiene increased, risk of enteric fever decreased and is found to be statistically significant ($p<0.001$). Several studies support this finding[13, 15, 16, 17].

In housing conditions, more than 3/4th patients (79.65%) had Kaccha house. A study done by Gasem MH et al[17] also had similar observation. Poor housing condition is associated with increased fly population and in turn enteric fever.

Majority (72.09%) had unhygienic storage of drinking water. The study conducted by S. Bhatti et al[15] also found that enteric fever was associated with lack of clean and safe water. More than half of respondents (54.65%) had unhygienic storage of cooked food. This was consistent with findings Gasem MH et al[17].Insanitary waste disposal was seen in more than 2/3rd of cases (68.02%).Several studies[11, 17] support this finding.

The overall duration of hospital stay ranged from 2 to 35 days with mean 7.91 days and S.D. 5.45 days. The present study findings were more or less comparable with the findings of other studies[13, 14]. The longer duration of stay in some patients may be due to development of complications or patient may be reported late when the complications were already developed. Fatality rate observed in this study was 1.74%. Dr. Amit Kulkarani[12] in a hospital study found that mortality was 4%.

CONCLUSION

Thus present study found majority of patients in 11-20 years (school children and adolescents) age group. There was significant association of literacy status, socioeconomic status and personal hygiene with development of enteric fever.

RECOMMENDATIONS

1) The specific age group like school going children and adolescents should be identified as high risk group and imparted health education towards prevention of enteric fever.
2) Improving educational status of people and in cases of children, educational status of parents especially mothers should be increased through adult education classes.
3) Sanitation should be improved by protection and purification of drinking water supplies, provision of basic sanitation and promotion of food and personal hygiene. These measures should be followed by health education.

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