

An Epidemiological study of Enteric Fever among children attending OPD of a tertiary Medical Institute situated in rural area

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Received: 25-09-2019 / Revised: 06-11-2019 / Accepted: 10-11-2019

ABSTRACT

Introduction: Typhoid fever is a commonly encountered systemic disease caused by the gram negative bacteria *Salmonella enterica* serovar typhi. It is considered as one of the most serious infectious disease threats to public health on a global scale because of its rapid and widespread emergence of resistance to multiple antibiotics. Looking at the serious consequences of Enteric fever among children, it is important to know the burden of the problem with its correlates. This will help in formulating interventions for prevention and control. **Methods:** Primary caregivers (mother/father/ guardians) of 100 ill children aged 2–12 years who came to seek medical care in out-patient department (OPD) for their children were interviewed. Study subjects fulfilling the inclusion criteria were selected by simple random sampling method. The study was conducted over a period of 7 months. Detailed Clinical Examination was done of all 100 children. Diagnosis was made on the basis of Suggestive clinical features & Serology by Widal test with titre of TO > 1:160 was taken as diagnostic. **Results:** Total of 100 cases of enteric fever case were Examined / seen in OPD / admitted during the study period. The leading clinical feature were fever, headache, followed by coated tongue & anorexia. Total 78 out of 100 suspected cases were Widal Positive. Positive and significant relationship was found between the source of drinking water, level of housing, Education of Parent & levels of earning with typhoid. **Conclusion:** This study presents important insight into the burden of Enteric fever in rural children. These findings can be used to plan future strategies for health education interventions in the community. There is a need to take immediate measures for prevention and control of Enteric fever in children. Awareness campaigns about the common causes & complications related to Typhoid are recommended

Key words: Enteric Fever, Rural, Children, Epidemiology.

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INTRODUCTION

Pediatrics population forms a considerable proportion of the total world's population. Enteric fever or typhoid is one of the major causes of morbidity among the human population in many regions of the world. It is caused by *Salmonella enterica* subspecies enterica serovars Typhi, Paratyphi A, Paratyphi B, and Paratyphi C. It is estimated that there is 1% fatality rate annually.^[1] The current knowledge on epidemiological aspects comes from studies in adult populations.^[2]

However, there are conflicting opinion about the prevalence rate in paediatric age groups.^[3]

The disease is mainly associated with low socioeconomic status and poor hygiene, with human beings the only known natural hosts and reservoir of infection.^[4] It is considered as one of the most serious infectious disease threats to public health on a global scale because of its rapid and widespread emergence of resistance to multiple antibiotics.^[5]

For the developing countries of the tropics and subtropics it continues to be a big public health problem as the sanitation and public health standards are poor.^[6] Typhoid fever is endemic in the south East Asian countries.^[7,8] Above 22 million new cases occur each year round the world while 90% of the sufferers are from the south East Asia. Reported deaths from typhoid accounts to around 2,16,000 per year.^[9-12]

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Typhoid fever disrupts the normal life of the sufferers due to long recovery period to resume normal activities.^[6] Rural areas usually suffer from sanitation problems due to poor water supply and unhealthy practice of disposing human excreta and garbage.

Looking at the serious consequences of Enteric fever among children, it is important to know the burden of the problem with its correlates. This will help in formulating interventions for prevention and control. Prevention of ear diseases is possible only if the risk factors are known. There is paucity of literature about the burden of ear morbidities in children and its determinants in this part of the country. This study presents results of a study conducted with objective to determine Epidemiological correlates & determinants of Enteric Fever in children around rural practice field area of a tertiary medical care Institute

METHODOLOGY

This Cross Sectional study involved Prior Consent & was found to be within ethical standards. In the study Patients & primary caregivers (mother/father/guardians) of 100 ill children aged 2–12 years who came to seek medical care in out-patient department (OPD) for their children were interviewed. Study subjects fulfilling the inclusion criteria were selected by simple random sampling method.

Inclusive criteria included 100 children who attended the paediatric outpatient department of Raipur Institute of Medical Sciences, Raipur with fever of more than 7 days duration within a timeframe of Jan 2019 to July 2019 were enrolled in this study and selected randomly by using table of random number method. Diagnosis was made on the basis of clinical features like continued fever, toxic look, diarrhea /constipation, splenomegaly, hepatomegaly, diffuse tenderness and doughy feeling of the abdomen. Serology by Widal test with titre of TO > 1:160 were taken as diagnostic. After initial enrollment patients were evaluated by detailed history and comprehensive physical examination by following standard procedures and all information's were documented with a Predesigned semi structured questionnaire. The questionnaire contained information related to the epidemiology and clinical presentations of typhoid fever. After that all patients were investigated particularly CBC, Platelet count, PBF, and Widal test. Other investigation details such as a chest X ray, liver function test, abdominal sonography was also collected. An amount of 3 ml of blood was sent for Widal test. A raised titre of anti O > 1: 160 with relevant clinical features as well as other blood parameters were considered significant of having typhoid fever. The ethical issue was addressed by

reading out a consent form in local Chhattisgarhi Language and obtaining a verbal permission. Socio demographic data namely, patient's age, source of drinking water and food habit along with parentis education, occupation of main earning member of family (father /mother) and housing status were collected through semi structured interview schedule having close and open ended questions and were coded accordingly.

Detailed Clinical Examination was done. Data was filled in Microsoft Excel & analysed using a computer software Epi Info version 6.2 (Atlanta, Georgia, USA). P value of 0.05 and less was considered as statistically significant. Results were presented in simple proportions and means (\pm SD). Number and percentage were used for presentation of data. Chi-square or Spearman rank correlation test was used to examine relationships among the variables due to nominal and ordinal types of data and their nature of distribution. The results were considered statistically significant if "p" value was less than 0.05.

Widal test

The Widal tube agglutination test is performed according to the manufacturer's instruction, using Tidal (Span diagnostics) containing O and H antigens of *S. typhi* and *S. paratyphi* A and *S. paratyphi* B. Positive and negative serum controls are included, a titre of \geq 1/160 to either antigen in a single serum specimen (in addition to the seroconversion) was taken to be indicative of typhoid fever. The results are correlated with blood culture results and interpreted in conjunction with the patient's history and recent clinical presentation on attending Pediatrics OPD and taking sample.

RESULTS

Total of 100 cases of enteric fever case were Examined / seen in OPD / admitted during the study period. There were 53% males and 47% females. 37% children were less than 7 years of age, 63 % were more than 7 years of age. The relationship between age categories and prevalence of Typhoid fever was not statistically significant.

Majority of families were Hindu (98%) and nuclear type residing in same community. Mean (\pm SD) monthly family income was INR 6837.5 \pm 1255.30.

Frequency of Typhoid fever was highest among the children of parents having education above primary level but not crossing HSC. Incidence of Typhoid fever was highest among the patient of the parent with semi pucca house followed by pucca house.

High prevalence of Typhoid fever was observed among the patients habituated with supply water without boiling followed by supply water with boiling and tube well water. Positive and significant relationship was found between the source of drinking water with prevalence of Typhoid fever.

Total 78 out of 100 suspected cases were Widal Positive.

The leading clinical feature were fever (100%), headache (90%), followed by coated tongue (83%) & anorexia (80%). [Table 1]

Table 1: Signs and Symptoms in the Patients

Symptoms / Signs	Number / Percentage
Fever	100
Headache	90
Vomiting	23
Anorexia	80
Abdominal Pain / Abdominal Distension	64
Diarrhoea	55
Hepatomegaly	4
Splenomegaly	5
Coated Tongue	83

Positive and significant relationship was found between the source of drinking water, level of housing, Education of Parent & levels of earning with typhoid.

DISCUSSION

A cross-sectional study was conducted among 100 children aged 2–12 years presenting in the Departmental OPD & rural health centre of Raipur Institute of Medical Sciences, Raipur. Data was collected from primary caregivers of children using semi-structured questionnaire to assess burden of ear morbidities and their determinants. The magnitude of Enteric fever among children was 78%. In our study 100 children were selected on clinical basis to see the sociodemographic background of Typhoid fever. Widal test was done in all the cases for confirmation of clinical diagnosis. 78 were Widal positive with agglutination titre of 1:160 or more. We did not go for Blood culture due to resource constraints.

Results show that prevalence of typhoid fever was highest among the school age patients compared to adolescents and preschool age children. Such results might be due to the fact that school age children had more chance of having unsafe drinking water and contaminated food at school from vendors on the streets. Significant and positive relationship was found between education of parents and prevalence of Typhoid fever. Such result might be due to shortage of full time care by literate parents because of their involvement in occupation. Results relating to housing category indicated that number of Typhoid fever patient was highest among the patient of the parent

having semipucca housing followed by pucca. There is more scopes of unhygienic environment in semipucca house as compare to the pucca house.

Typhoid fever was observed among the patients habituated with supply water without boiling followed by supply water with boiling and tube well water. Contaminated water is one of the important sources of *S. typhi*.^[13,14] Park opined that occurrence of Typhoid fever can be reduced by purification of drinking water. There was a positive and significant ($p = 0.023$) relationship between source of drinking water and prevalence of Typhoid fever.

The overall awareness regarding problems was poor in patients & patients

Rest Correlates were not significant.

This study presents important insight into the burden of Enteric fever in rural children. These findings can be used to plan future strategies for health education interventions in the community. There is a need to take immediate measures for prevention and control of Enteric fever in children.

CONCLUSION

It is imperative to include Enteric fever in the differential diagnosis of febrile paediatric patients with abdominal symptoms. Even though blood culture is the confirmatory test, Widal test plays supportive role in diagnosis of enteric fever, especially when patients come after a course of antibiotics. In the present study, ciprofloxacin is still a good drug for the treatment of enteric fever. Awareness campaigns about the common causes & complications related to Typhoid are

recommended. This study and its results are applicable to the geographical and socioeconomic status around our hospital. As we could not compare these results with another setup, we cannot ascertain the prevalence in other areas.

ACKNOWLEDGEMENTS

We would like to thank all the participants, Dean & HOD for his always available guidance.

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Conflict of Interest: None

Source of Support: Nil