

Typhoid Fever among Paediatric Patients Attending Fort Portal Regional Referral Hospital, Kabarole District Western Uganda

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ABSTRACT

Typhoid fever continues to be a major public health problem in many developing countries. In Uganda, an outbreak of typhoid fever in Kasese District sickened 8092 persons from 27 December 2007 to 30 July 2009, resulting in at least 249 intestinal perforations and 47 deaths. The study was aimed at determining the prevalence of typhoid fever among pediatric patients attending Fort Portal Regional Referral Hospital, Kabarole district and also to describe the clinical picture of typhoid fever among pediatric patients attending Fort Portal Regional Referral Hospital. The study was a cross-sectional descriptive study which involved 73 participants with questionnaire forms. The questionnaire was designed according to the objectives of the study. The study was conducted from August 2022 to September 2022. The children with three or more days of fever, no obvious focus of infection and clinically suspected typhoid fever were screened. Sterile Blood samples were obtained from febrile patients and typhoid tests were performed for the diagnosis of typhoid fever in the suspected populations. In this study, the majority of the participants were males 39 (53.4%) and the females were 34 (46.6%) and all these patients were clinically suspected of typhoid fever. Of these, 5 (6.8%) patients were positive serologically. The disease was more prevalent in school-age children (5-12 years). Although non-significant association was observed on a sex basis. The patients who were tested positive, all of them presented with fever (100%), then anorexia (80%), headache (80%), abdominal pain (60%), body aches (60%), and vomiting (60%). Elevated body temperature was the most prevalent sign (80%), followed by hepatomegaly (40%), toxic appearance (40%), and pallor (40%). The prevalence of typhoid fever according to this study was slightly higher in comparison to other studies and the most common symptom among these patients was fever. The community needs to be sensitized to proper hygiene to prevent typhoid fever.

Keywords: Typhoid fever, Public health, Pediatric patients, Proper hygiene.

INTRODUCTION

Typhoid fever (TF) continues to be a major public health problem in many developing countries including Uganda. Globally, TF is an important cause of morbidity and mortality in many regions of the world, with an estimated 12 - 33 million cases leading to 216,000 - 600,000 deaths annually [1, 2]. The disease still causes a devastating burden in many low- and middle-income countries, with recent estimates of global incidence ranging between 11.9 million [3] and 26.9 million [4] cases per year, and mortality estimates ranging between 129 000 and 161 000 annually [5, 6], based on an assumed case fatality rate of 1%. In the Journal of American Medical Association published on 15 June 1907 (Typhoid Mary), George Soper discovered that the family's cook, Mary Mallon was a healthy carrier of the typhoid bacteria who spread typhoid in the restaurants she served as a cook. The disease is endemic to areas of Africa, India, and South and Central America, as these areas have rapid

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population growth, increased urbanization, and limited safe water, infrastructure and health systems [7]. The first population-based study from an urban slum in Africa suggested very high rates of bacteremia with typhoid fever where rates per 100,000 children per year in children 2–4 years of age were 340, 573, and 1,870, respectively. It is likely that because of the dense population and severely limited options for sanitation and safe water, people living within urban slums in Africa and Asia, are at higher risk for typhoid fever [8]. According to the study conducted by Kibiru Andrew Benjamin Nguri in East Africa (Kenya); the majority (63%) of the study population had suffered typhoid episode at one time or another in their lifetime, while (37%) did not, hence the high prevalence of typhoid in the area [9]. In western Uganda, from December 27, 2007, to July 30, 2009, 577 cases were reported, 289 were hospitalized, and 249 were Patients; 47 deaths from typhoid fever occurred; Salmonella typhoid Was isolated from 27 (33%) of 81 patients (Neil, 2012). A study by Agwu found that typhoid is highly (36.6%) prevalent among febrile patients aged (10–29 years old) attending clinics in Bushenyi [10].

Typhoid fever is a major cause of mortality and morbidity worldwide. In endemic areas, the disease is most commonly found in children 5–19 years of age. Visitors from non-endemic areas are also at risk if unvaccinated. [1, 8]. The global burden of the disease in low- and middle-income countries in 2010 was estimated to be 11.9 million cases, including 129,000 fatalities, after adjusting for water-related risk factors [11]. There are an estimated 11–21 million cases of typhoid fever and approximately 128 000–161 000 deaths annually, compared to an estimated 6 million cases of paratyphoid fever and 54 000 deaths annually [12]. In Uganda in 2011, MOH reported, that an outbreak of typhoid fever in Kasese District sickened 8092 persons from 27 December 2007 to 30 July 2009, resulting in at least 249 intestinal perforations and 47 deaths. Typhoid fever can be fatal especially in children [13, 14]. Numerous typhoid cases were again reported in Kasese and neighbouring Bundibugyo District with many more intestinal perforations and emergence of multidrug-resistant strains [10]. According to Agwu [15], typhoid is highly prevalent among febrile patients aged 10–29 years old attending clinics in Bushenyi and febrile illnesses have continued to escalate in southwestern Uganda despite using multidisciplinary studies and interventions to control the syndrome. WHO Uganda in 2016 reported that during the month of December 2015, typhoid cases were reported by nearly all districts [16, 17]. Central region reported the highest number, with Kampala, Wakiso, Mubende and Luweero contributing to the bulk of these numbers. With 240 cases from the Kabarole district [10]. The study was aimed at determining the prevalence of typhoid fever among pediatric patients attending Fort Portal Regional Referral Hospital, Kabarole district and also to describe the clinical picture of typhoid fever among pediatric patients attending Fort Portal Regional Referral Hospital.

Methodology

Study design

This was a hospital-based cross-section descriptive study to determine the prevalence of typhoid fever in children and describe the clinical profile of children with typhoid fever in Fort Portal Regional Referral Hospital.

Area of Study

The study was conducted in Fort Portal Regional Referral Hospital, Kabarole district, western Uganda. The hospital lies within the city of Fort Portal, approximately 148 kilometres, by road, west of Mubende Regional Referral Hospital. This location is approximately 294 kilometres west of Mulago National Referral Hospital, in Kampala, Uganda's capital and largest city. The coordinates of the hospital are 0°39'19.0"N, 30°16'53.0"E (Latitude: 0.655278; Longitude: 30.281389).

Study population

The study population comprised patients seeking health services from Fort Portal Regional Referral Hospital in Kabarole district.

Inclusion criteria

Children who were 12 years and below, who were medically confirmed with typhoid fever or medically confirmed typhoid fever during the study time, or in the past 12 months. Patients are medically confirmed with typhoid fever through laboratory tests, such as; Widal tests, blood cultures, stool cultures, or bone marrow cultures, during the study time or 12 months earlier.

Exclusion criteria

All individuals older than 12 years of age, and those who were not medically confirmed with typhoid fever during study time or 12 months before were excluded from the exercise.

Sample size

The sample size was calculated using Kish Leslie's [18] formula:

$$N = z^2 p (1-p) / E^2$$

Where: N = Estimated minimum sample size required

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P= proportion of a target population estimated to have similar characteristics,

Z= 1.96 (for 95% confidence interval)

E= margin of error set at 5%

The prevalence of typhoid fever of 5% was confirmed by the detection of its biomarker using blood culture in a study conducted in Shashemene Referral Hospital, southern Ethiopia by Habte, et al., 2018:

$$n = (1.96)^2 \times 0.05(1-0.05) / (0.05)^2$$

n =73.

Therefore 73 children were recruited for the study.

Sampling procedure and rationale

Consecutive enrollment until the sample size was attained.

Research instruments

The questionnaire included: semi-structured questions for demographic data and clinical features of typhoid fever.

Data collection procedure

Data collection was followed by consent from the responsible Head of the department Fort Portal Regional Referral Hospital. To the participants in the study, data was collected using a questionnaire. The interview was conducted among patients in Fort Portal Regional Referral Hospital. Responses of the participants were filled into the questionnaire by the researcher and research assistants; this method was used because it allowed for accurate records of responses from both illiterate and literate respondents.

Data management

Questions in the tools were pre-coded to help the researcher get uniform qualified data, and coding frames shall be met, facilitated by the codes given to responses in the tool (questionnaire). This made the process of presentation and analysis easy. The research instruments were checked for errors and omissions in order to ensure consistency, completeness and accuracy. This was done in the field before going to respondents. Both electronic and non-electronic data were used to store data with codes so that it could be assessed by unauthorized persons, and help to enhance confidentiality.

Data analysis

Data was analyzed using SPSS VERSION soft Excel. The data was presented using variant tables, and pie-charts, and put in representative figures to ease the process of interpretation of findings.

Ethical considerations

A letter of introduction was obtained from Kampala International University's western campus, faculty of clinical medicine and Dentistry that introduced the researcher to the head of the department Fort Portal Regional Referral Hospital and sought permission to carry out the study. In addition, the researcher explained the purpose of the study to each study participant after which informed consent was obtained from the participants before participating in the study. In order to ensure confidentiality, the names of the respondents were not taken and the information given during the interview sections was not released to anyone. To further gain the trust and safeguard the privacy of respondents, the interviews were done privately and in secured areas of the health centres.

Results

Socio-demographic information of respondents

Table 1:Demographic Characteristics of the Respondents

Demography		
Gender	Frequency	Per cent
Male	39	53.4
Female	34	46.6
Total	73	100.0
Education		
Not started school	42	57.5

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Nursery	19	26.0
Primary	10	13.7
Secondary	2	2.7
Total	73	100.0
Age		
0 – 12 months	11	15.1
1 -3 years	18	24.7
3 -5 years	22	30.1
5 -7 years	15	20.5
7 -12 years	7	9.6
Total	73	100.0

Source: Field Data, 2022

The study findings on the gender of the respondents concealed that the majority of the respondents were male (53.4%), and the females were (46.6%) The results critically show that males dominated the study however females were also considered during data so as to enable the researcher to attain unbiased information. The study findings also provided that the respondents were mostly the children who had not yet started school (57.5%) of the respondents, the children who had nursery school (26.9%) of the respondents, the children in primary education (13.7%) the respondents while those in secondary were (2.7%) of the respondents. Concerning the age of the respondents, the majority of the respondents were the age group between 3-5 years who were (30.1%) of the respondents, followed by 1-3 years who were (24.7%) of the respondents followed by those 5-7 years who were (20.5%) of the respondents, followed by 0-12 months with (15.1) while those of 7-12 years were (9.6%) of the respondents.

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The prevalence of typhoid fever among pediatric patients attending Fort Portal Regional Referral Hospital, Kabarole District, Western Uganda

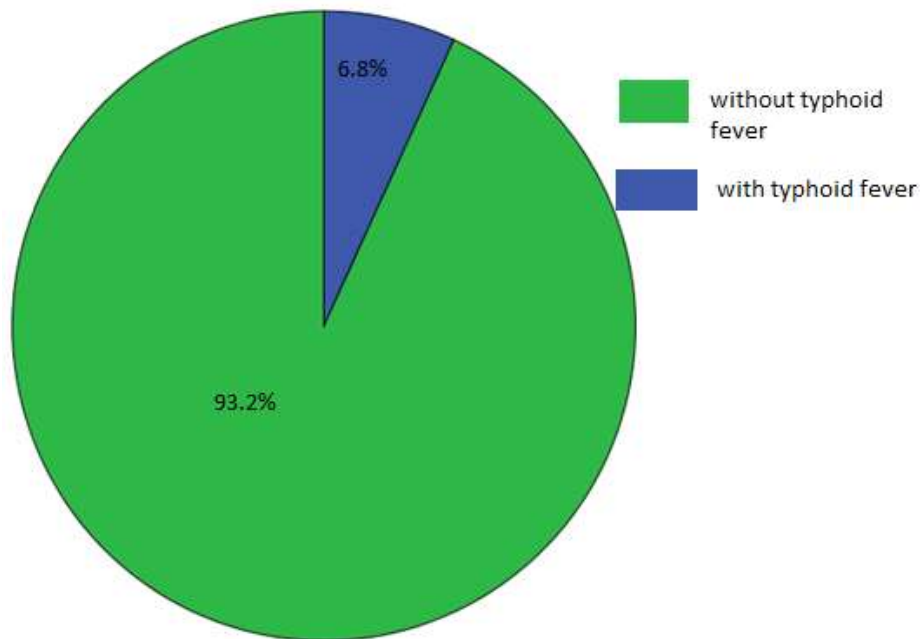


Figure 1: pie chart showing the percentage of the participants with typhoid fever and participants without typhoid fever.

The pie chart above shows the percentage of patients who tested positive (6.8%) and negative (93.2%) for typhoid fever over 2 months of the study. Hence the prevalence of typhoid fever among pediatric patients in Fort Portal Regional Referral Hospital over the two months of the study was found to be 6.8%.

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The clinical profile of pediatric patients with typhoid fever in Fort Portal Regional Referral Hospital.

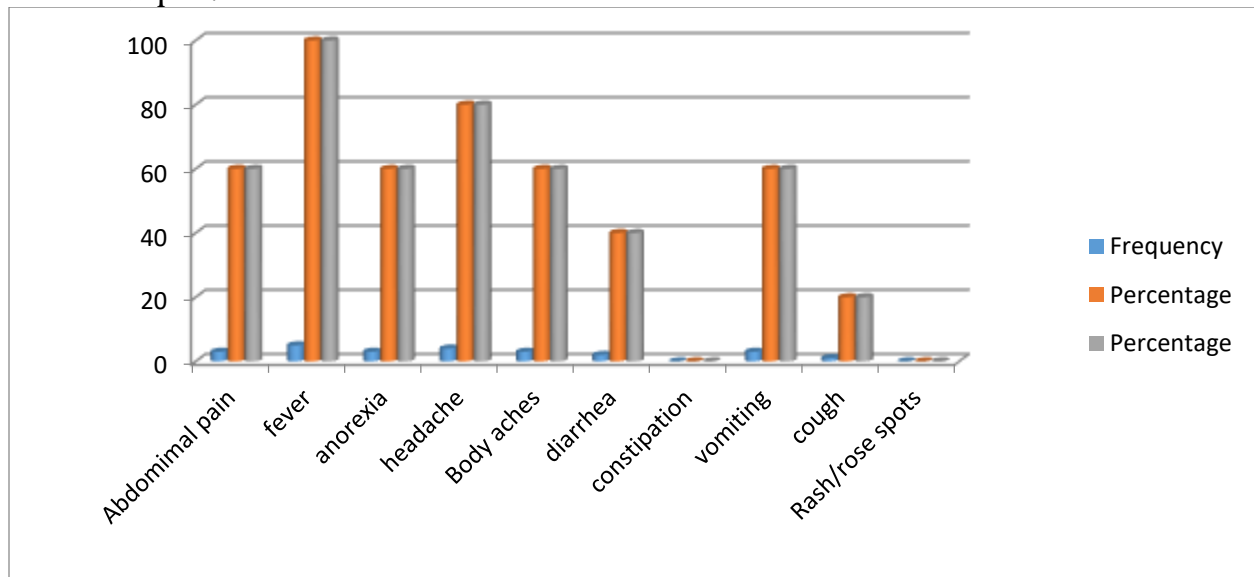


Figure 1: Column chart showing symptoms of typhoid fever

The graph above shows that all the patients who were confirmed with typhoid fever had fever as one of their presenting symptoms (100%), other symptoms like anorexia (80%), headache (80%), abdominal pain (60%), body aches (60%), vomiting (60%), diarrhoea (40%) and cough (20%).

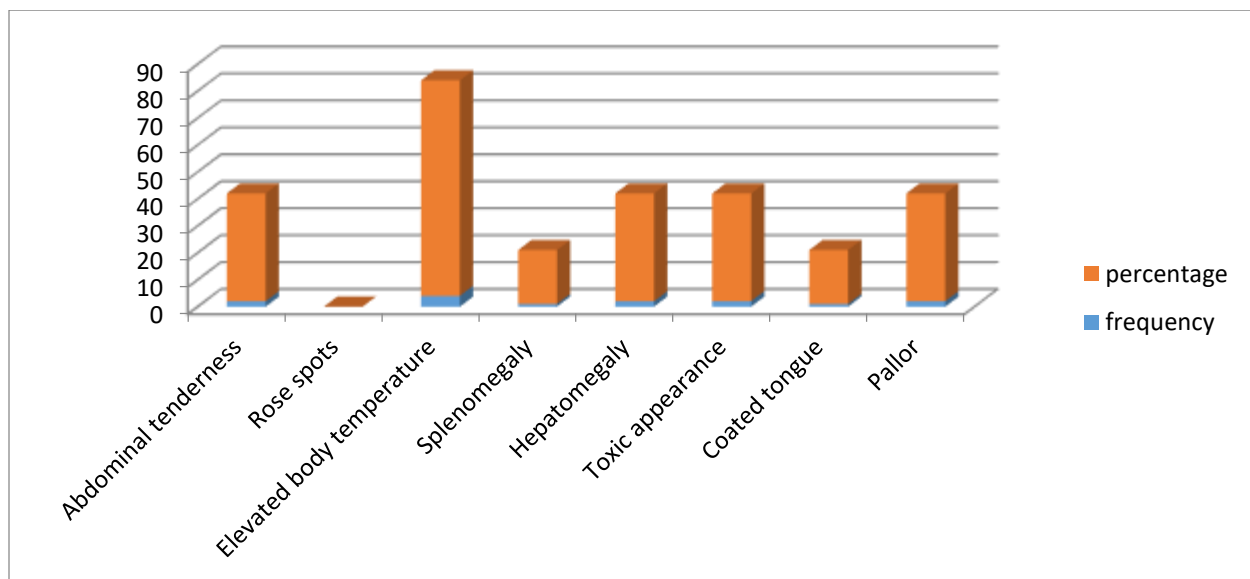


Figure 2: Column chart showing signs of typhoid fever

From the above column graph, the most common sign found in patients with typhoid fever was elevated body temperature (4 patients or 80%). Other signs found on the patients included toxic appearance (2 patients or 40%), hepatomegaly (2 patients or 40%), pallor (2 patients or 40%), abdominal tenderness (2 patients or 40%), splenomegaly (1 patient or 20%), and coated tongue (1 patient or 20%).

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DISCUSSION

The prevalence of typhoid fever among pediatric patients attending Fort Portal Regional Referral Hospital, Kabarole District, Western Uganda

According to our study, we observed a prevalence of 6.8% over the study period of about 2 months. The study was concordant with studies conducted in southern Ethiopia (5%) among febrile patients with symptoms clinically similar to typhoid fever and also central Ethiopia (4.1%), and Kenya among adult patients (6.3%) and in Papua New Guinea among all age groups (4%). However, our finding was higher than those studies including the study conducted in Mekelle, Ethiopia (1.6%) and lower than a study conducted in Egypt (13.64%). The differences could be explained by the geographical location where participants in our study since most of them come from the rural areas and are exposed to poor hygienic practices like drinking un-boiled water. Most of the parents of our participants have poor formal education backgrounds since most of them were not able to speak English and also the poor background of the families might tend to have more typhoid risk. In addition, poor hygienic practices among people who come from rural areas like hand washing practices after the toilet, open defecation practices near the springs and rivers and inadequate medical care may serve as a carrier of transmission [19, 20]. The difference could also be due to the disparity in study population, time of studies, also a mode of laboratory investigation technique disparity also has an effect on the results.

The clinical profile of pediatric patients with typhoid fever in Fort Portal Regional Referral Hospital

The current study also assessed the patterns of clinical presentation to help in case identification at presentation to health facilities where there is no confirmatory microbiological test and it was found that patients having constant fever for 5 or more days, headache, abdominal pain, anorexia and vomiting had a significant association with the positive test results. This is in accordance with the World Health Organization (WHO) guidelines in that the most common manifestations of untreated typhoid fever in the first week of infection were stepped ladder fever pattern or insidious onset fever skin rash, anorexia, mild cough and constipation. The most common symptoms apart from fever are anorexia, vomiting, pain abdomen, and diarrhoea followed by headache and cough [21, 22]. Contradictory to this, a study done by Do et al. [23] reported headache as the most common symptom next to fever. In our study, we reported elevated body temperature (80% or 4/5 patients) as the most common sign followed by abdominal tenderness (40% or 2/5 patients), Hepatomegaly (40% or 2/5 patients), toxic appearance (40% or 2/5 patients), pallor (40% or 2/5 patients), splenomegaly (20% or 1/5 patients), and coated tongue (20% or 1/5 patients). A study done by Laishram et al. [24] reported coated tongue (80%) as the most common sign followed by Hepatomegaly (76%) and splenomegaly (38%). Another study reported a toxic look (93%) and a coated tongue (66%) as the most common signs. In another study, they reported relative bradycardia and hepatomegaly as the most common signs. Nusrat et al. [25] reported the most prevalent symptom to be fever followed by abdominal pain and the most prevalent sign to be a toxic look followed by the coated tongue.

CONCLUSION

Typhoid fever remains a major public health problem in developing countries predominantly seen in school-going children among the pediatric age group. The prevalence of typhoid fever in this study was slightly higher in comparison with other studies. The most common symptoms the patients presented within the study were fever, headache, anorexia, abdominal pain and vomiting. The most common signs the patients in this study presented with were elevated body temperature, abdominal tenderness, hepatomegaly, pallor and toxic appearance. To confirm typhoid fever cases using blood culture, considering patients' clinical presentation such as duration of fever 5 days or more, abdominal pain and skin rash could decrease the time and cost associated with the diagnosis.

RECOMMENDATIONS

Residents should also be sensitized on the importance of having pit latrines at home for proper disposal of faecal matter. Residents should be sensitized on control of fly densities from their latrines, through covering of pit latrine holes, use of insecticides, use of VIP latrines, or smoking of pit latrines to avoid flies contaminating food and water. Residents should also be sensitized on the importance of washing hands with soap and clean safe water after visiting the latrine and before preparing or eating food. They should also be sensitized on the importance of washing and peeling fruits before eating. Local health and law enforcement authorities should strengthen and enforce food preparation and safety in hotels, restaurants and roadsides a significant number eat food from restaurants or foods old along roadsides. Local law enforcement and health authorities should also enforce laws requiring households in this area to have rubbish pits.

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