



Enteric Fever Pattern among Patients Attending General Hospital Kaltungo

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Salmonella typhi and *Salmonella paratyphi* causes typhoid and paratyphoid fevers respectively. Out of the one thousand two hundred and six (1206) sample analyzed for Typhoid and Paratyphoid fevers using tile method; 748 (62.0%) were positive while 458 (38%) were negative. Females were found to have the highest positivity rate of 413 (68.4%), while males had 335 (55.5%) positivity rate. The age bracket with the highest positivity rate 0-10years and above (28.3%), followed by 11-20years (26.2%). The age bracket with the lowest percentage positivity was 60years and above (6.0). We therefore wish to conclude that women should take personal hygiene serious and people from the following age groups of 0-10years and those at age 11-20 regardless of their sex should do likewise as Salmonellosis was found to be high among those categories of people.

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1. INTRODUCTION

In the developing countries, there is an estimate of annual incidence of 540 per 100, 000 of enteric fever which caused by both *Salmonella typhi* and *Paratyphi* [1]. The World Health Organization [2] estimated an annual incidence of enteric fever to be about 17 million cases worldwide. It is often encountered in tropical countries including Nigeria where they constitute serious sources of morbidities and mortalities [3]. Typhoid and paratyphoid fevers are infections caused by bacteria, which are transmitted from faeces and urine to the mouth by ingestion. However, clean water, good hygiene and proper sanitation prevent the spread of typhoid and paratyphoid. Contaminated water is one of the pathways of transmission of the disease [2].

Salmonella typhi and *Salmonella paratyphi* are the bacteria that causes typhoid and paratyphoid fever respectively. *Salmonella* specie are gram-negative bacteria, motile though non-flagellated variants occur. They are found in the intestine and are called intestinal pathogens [4].

Salmonella infects both man and mammals with associable inflammatory reaction in the intestinal tract. Typhoid and paratyphoid germs are passed in the stool and urine of people infected (Mayembe *et al.*, 2009). Once the bacteria gain access to the body, it multiplies and spreads from the intestine into the blood stream, then penetrate further to other organs [2].

People above 70 years and those below 20 years of age are the category of people that have the highest risk of getting infected with typhoid fever. Eating food like un-cooked meat or eggs and unwashed vegetables or fruits poses a great threat in infection due to salmonella (Naheed, 2007).

Shell fish obtained from sewage-contaminated water serves as one of the major means of been exposed to an infection. Also, food handlers sometimes contaminate food [2].

Carol stated that infection through contaminated surgical equipment and person-to-person contact in hospital has also been reported [5]. Another risk factor associated with typhoid and paratyphoid fevers is visiting or living in areas where typhoid fever occurs [4]. *Salmonella typhi* somatic antigens and glycolipid

micro capsule are the virulence antigen [6]. Typhoid fever is a global health problem which real impact is difficult to estimate because the clinical features is confused with those of many other febrile infections.

The impact of Typhoid fever on social and economic status of the patient is high, this is due to the fact that the complication that may arise because of the hospitalization of patients with acute disease and loss of attributes to the duration of the clinical illness.

Typhoid fever is one of the most infectious diseases affecting many communities in African countries and even the world at large since there are many different species of salmonella. In acute or chronic state of infection it leads to severe headache, weakness, vomiting, and fatigue. In some cases, it is associated with stomach pain and if not properly treated can lead to intestinal perforation which requires operation and affect the financial state of the family subsequently affecting the economic conditions of the community [7]. Because of its great social-medical problem and high morbidity and mortality, it is therefore important to determine the incidence of salmonella infection by highlighting its implication in Kaltungo Local Government area of Gombe State and the different sources of drinking water in Kaltungo, which may serve as a potential source of the infection.

1.1 Associated Risk Factors

Centers for disease control and prevention enumerated the fact that there are about 22 million persons that become affected by Typhoid fever yearly in the developing countries such as Africa, India, South America, South east Asia and others [8].

The factors that may increase the risk of being infected by Typhoid are listed below:

1. Being to places where there is endemicity of typhoid fever.
2. Handling the micro-organism
3. Coming in contact with persons infected with typhoid fever
4. Weakened immune system
5. Contaminated water usage [9].

2. MATERIALS AND METHODS

2.1 Study Area

General Hospital Kaltungo is a secondary Health care located in Kaltungo Local Government Area along Yola road. There are 11 local governments in Gombe State in which Kaltungo is among. Kaltungo is located at South-East of Gombe bounded by Shongom Local Government Area by South-East Balanga Local Government Area by East and Billiri Local Government be West. In the year 1991, Kaltungo Local Government was created, which has an area of 881Km and population of 149,805 as of 2006 census.

2.2 Sample Size

All patients that came to the lab for Widal test from 1st February, 2021 to 30th April, 2021 were recruited for this study, totaling 1206 (One thousand two hundred and six) where 603 are Male and 603 are Female.

2.3 Widal Test

Principle: The principle of the test is based on antigen and antibody reaction. The antigen from the test reagents reacts with the antibodies developed by the patients thereby leading to a visible clumping [10].

2.4 Method of Sample Processing

Blood samples collected were centrifuged at 3000 revolution per minutes for 6 minutes.

The reagents alongside the serum were allowed to attain room temperature within an hour before the test was carried out using the tile agglutination method for Widal test [11]. Procedure as shown below:

- a. A drop of the serum was placed on eight different reaction circle of the tile and the stained antigen reagent was added respectively
- b. It was mixed using different applicator stick
- c. The tile was rocked for two minutes, and the agglutination was observed immediately. Therefore, the result was recorded according to the level of the agglutination.

2.5 Method of Data Analysis

The data collected at the course of this research is been analyzed using the frequency table and is been converted to percentage.

3. RESULTS

Table 1 shows that the prevalence of typhoid infection among the study group is 62% (748) were positive, while, 458 (38%) were negative.

Table 2 shows that, of the 1206, 603 were male and out of which 335 were positive representing 55.5%, also, 413 representing 68.4% out of 603 females were positive.

Table 3 explains typhoid infection in relation to age, <1-10 had 329 out of which 212 (64.4%) were positive, ages 11-20, 345 were examined out of which 196 (56.8%) were positive, 21-30 age group had 217 examined, of which 131 (60.4%) were positive, age group 31-40 had 114 examined, 74 (64.9%) were tested positive. Similarly, age group 41-50 had 92 examined, out of 58 (63%) were positive, age group 51-60 had 46 examined, 32 (69.6%) were positive, lastly, the highest infected group with typhoid had 63 examined, 45 (71.4%) were tested positive.

Table 1. Shows the prevalence of typhoid infection among the study group

Status	Prevalence	Percentage (%)
Positive	748	62.0
Negative	458	38.0
Total	1206	100

Table 2. Prevalence of typhoid infection within Gender

Gender	Number Examined	Number Positive (%)
Male	603	335 (55.5)
Female	603	413 (68.4)
Total	1206	748 (62.0)

Table 3. Prevalence of typhoid infection in relation to age

Age (years)	No Examined	No Positive
<1-10	329	212 (64.4)
11-20	345	196 (56.8)
21-30	217	131 (60.4)
31-40	114	74 (64.9)
41-50	92	58 (63)
51-60	46	32 (69.6)
>60	63	45 (71.4)
Total	1206	748 (62)

4. DISCUSSION

All patients that came to laboratory from 1st February, 2021 to 30th April, 2021 were recruited, totaling 1206. The result obtained from the research showed that Out of the one thousand two hundred and six (1206) Sample analyzed; 748 (62.0%) were positive while only 458 (38%) were negative. Based on this research findings it implies that positivity rate is high (62%) in General Hospital Kaltungo. Females were found to have the highest positivity rate of 413 (68.4%), while males had 335 (55.5%) positivity rate. This agrees to reports made by Adeleke, et al. [12] where female had 53.3% and males had 46.7%. Though our percentage is higher than hers. the difference could be due to the fact that their sample size of 150 is lower than our own (1206). Also, this is not in agreement with Igwe et al., [13] that stated 52.3% was seen in male, while 51.1% was seen in male in State Specialist Hospital Gombe State. The age bracket with the highest positivity rate was 0-10years and above (28.3%), followed by 11-20years (26.2%), this can be attributed to their eaten pattern and having low immunity in children. People from age group 60years and above were found to have lower rate of infection this may be attribute to their eating pattern just like the children and appetite loss which is normally seen within the old age individual.

5. CONCLUSION

We therefore wish to conclude from this research that typhoid fever infection in Kaltungo is high particularly among females and people from age group 0_20years. However, the aged (60 years and above) had lower rate of infection.

6. RECOMMENDATIONS

Considering the findings of this study, the following recommends were opined:

- Government should provide good source of portable water for the people of Kaltungo.
- Government should enforce the laws of good personal and environmental hygiene.
- Government should enforce the laws of proper screening of food handlers.
- Health care providers should intensify efforts on Health talks on mode of Typhoid fever transmission and preventive measures

CONSENT

Written informed consent was obtained from each participant before enrollment and confidentiality was assured.

ETHICAL APPROVAL

Ethics approval was obtained from the Health Research and Ethics Committee of the Ministry of Health Gombe, Gombe State.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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