

# Title: Prevalence of typhoid fever disease in rural area in South West Nigeria.

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## ABSTRACT

Typhoid fever is a bacterial infection caused by *Salmonella typhi* that can spread throughout the body, affecting many organs. Without prompt treatment, it can cause serious complications and can be fatal. It is rare in developed countries. This disease is treated with antibiotics and fluid. This study aims to determine prevalence of typhoid among patients Federal Medical Center (FMC) Ido Ekiti Ekiti state from 2018 to 2020. Descriptive retrospective study was carried out on eighty hundred forty six (846) patients tested for typhoid fever Federal Teaching Hospital Ido, Ekiti state from 2018 to 2020. Medical records of suspected patients tested for typhoid fever infection were collected from medical records of Health Information Management department of Federal Teaching Hospital Ido Ekiti, Ekiti state. SPSS software, windows version 19 was used to analyze data. Results were presented in statement, tables and bar charts. Statistical significance was set at  $P < 0.05$ . A total of 846 patients, age 1-65 years were analyzed. There are 314 males (37.1%) and 532 females (62.9%) giving an M.F ratio 1: 1.9. Widal test result showed that 340 (40.2%) patients were positive while 506 (59.8%) were negative giving ratio 1: 1.4. In 2018 numbers of positive cases were 210 (39.8%) while 318 (60.2%) were negative. In 2019 number of positive cases were 89 (41.2%) while 127 (58.8%) were negative. And in 2020 numbers of positive cases were 52 (42.3%) while 71 (57.7%). The results of this study showed that there were increased in typhoid fever in the communities. We are of the opinion that people should be sensitized about proper sanitation and personal hygiene.

**Key words:** complications, *Salmonella typhi*, antibiotics, sanitation, personal hygiene

## 1. INTRODUCTION

Typhoid fever is an endemic disease in the tropic and sub-tropic and has become a major public health. It is a life-threatening systemic infection caused by the bacterium, *Salmonella typhi* [5]. Improved living conditions and the introduction of antibiotics resulted in a drastic reduction of typhoid fever morbidity and mortality in industrialized countries. In developing areas of Africa, the Americas, South-East Asia and the Western Pacific regions, however, the disease continues to be a public health problem. WHO estimates the global typhoid fever disease burden at 11-20 million cases annually, resulting in about 128 000–161 000 deaths per year. Poor communities and vulnerable groups including children are at highest risk. This is especially worse in the developing nations of the world where it is a significant contributor to morbidity and mortality [14].

Typhoid and paratyphoid fevers are mainly transmitted via the faecal-oral route. The causative bacteria are passed in the faeces and urine of infected people, which may contaminate food, water or beverages and cause infection in those who have consumed the contaminated items [4]. It is pathogenic to both man and mammals with associable inflammatory reaction in the intestinal tract. People become infected after eating food or drinking beverages that have been handled by a person who is infected or by drinking water that has been contaminated by sewage containing the bacteria. Once the bacteria enter the person's body they multiply and spread from the intestines into the bloodstream [14]. Typhoid fever has a wide variety of presentations that range from an overwhelming multisystemic illness to relatively minor cases of diarrhea with low-grade fever. The classic presentation is fever, malaise, diffuse abdominal pain, and constipation [8]. *Salmonella typhicells* are aerobic, gram negative rods that colonize the gastrointestinal tracts, penetrate the epithelium and spread into the lymphoid tissue, liver, gall bladder of humans and occasionally the bloodstream. After approximately 3 months, most individuals stop shedding the bacteria in their faeces, however few individuals continue to shed *S. typhi* for extended period but show no symptoms. In these carriers, the bacteria continue to grow in the gall bladder and reach the intestine through the bile duct [11].

According to the World Health Organization, over 16 million people worldwide are infected with typhoid fever each year, with 500,000 to 600,000 fatal cases and high prevalence rate among children between the ages of 5 to 19 years. In Nigeria, typhoid fever remains a major disease because of factors such as increased urbanization, inadequate supplies of potable water, regional movement of large numbers of immigrant workers, inadequate facilities for processing human waste, overburdened health-care delivery systems, and overuse use of antibiotics that contribute to the development and spread of antibiotic-resistant *S. Typhi* [14]. However, the true incidence of typhoid fever is difficult to evaluate in Nigeria because of the lack of a proper coordinated epidemiological surveillance system. Nevertheless, information on typhoid fever prevalence has been documented by several researchers in some states in Nigeria ranging from 0.071% in Oyo to 47.1% in Osun [6].

Assessing the prevalence of typhoid fever is important for national health planners; therefore, the purpose of present study was to determine prevalence of typhoid fever disease in rural area in South West Nigeria. [14] Typhoid is spread by eating or drinking food or water contaminated with the feces of an infected person. Typhoid vaccines have not yet been considered for incorporation into the Expanded Immunization Program of health policy in Nigeria [2]. An additional barrier to reducing typhoid fever incidence in rural area of South West Nigeria is the lack of access to safe drinking water and improved sanitation facilities [2]. Risk factors include poor sanitation and poor hygiene .In rural area, there is no tap born water and people making use of other sources of water. Poor sanitation and poor hygiene is being practices in rural in South West Nigeria. Therefore the purpose of present study was to determined prevalence of typhoid fever in rural area in South West Nigeria [13].

## 2. METHOD

Descriptive retrospective study was carried out on eighty hundred forty six (846) patients tested for typhoid fever Federal Teaching Hospital Ido, Ekiti state from 2018 to 2020. Medical records of suspected typhoid fever patients were collected from Health Information Management department of Federal Teaching Hospital Ido-Ekiti that was tested using Widal agglutination test. Data collected were analyzed by using BMI SPSS Soft ware, windows version 19.0 (SPSS version 19, Chicago,IL. . Results were presented in statement, tables and bar charts. Statistical significance was set at  $P < 0.05$

## III. Results

The socio-demographic characteristics of the study are shown in table 1 Age of the patients ranged from 1 to 65 years. There were a marginally higher proportion of females than male

**Table : 1. Socio-demographic characteristics of patients**

| Variable         | No of patents | Percentage% |
|------------------|---------------|-------------|
| <b>Age Group</b> |               |             |
| <20              | 155           | 18.3        |
| 21-30            | 215           | 25.4        |
| 31-40            | 289           | 34.2        |
| 41-40            | 116           | 13.7        |
| 51-60            | 56            | 6.6         |
| >60              | 15            | 1.8         |
| <b>Gender</b>    |               |             |
| Male             | 314           | 37.1        |
| Female           | 532           | 62.9        |

Trend and data relating to the patients with positive widal agglutination test are shown in table 2. Of the 846 patients tested 340 (40.2 %) were positive while 506 (59.8) were negative in ratio of 1: 1.5. In 2018, of the 528 patients tested, 210(39.8%) were positive while 318(60.2%) were negative. In 2019, of the 216 patients tested, 89 (41.2%) were positive while 127(58.5%) were negative. In 2020, of the 123 patients tested 52 (42.3%) were positive while 71 (57.7%) were negative.

**Table 2 Widal agglutination test results**

| Widal test results | 2018        | 2019        | 2020       | Total N=846 |
|--------------------|-------------|-------------|------------|-------------|
| Positive           | 210 (39.8%) | 89 (41.2%)  | 52 (42.3%) | 340 (40.2%) |
| Negative           | 318 (60.2%) | 127 (58.8%) | 71 (57.7%) | 505 (59.8%) |

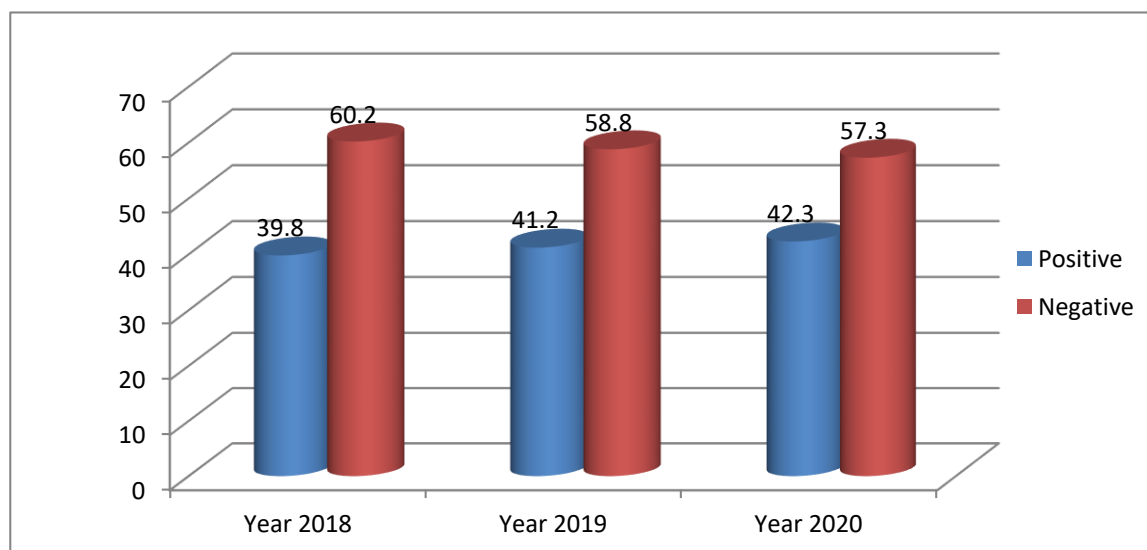


Fig. 1.Widal test results from 2018 to 2020

### 3. Discussion

In this study, the prevalence of typhoid fever is 40.2%. [5][7]. Some previous studies reported similar prevalence of 22.1% to 55% among febrile patients in various settings in Africa and Asia when using blood cultures. In contrary to our results [10] Ohanu et al, reported that 14.1% of a group of 810 febrile children and adult South East Nigeria were positive for typhoid culture.[9] Maude et al, reported that 11.3% of a group of 300 febrile adults/children in Bangladesh were positive for typhoid, as determined by blood culture and polymerase chain reaction (PCR) for *S. typh*, [12]. Ramyil et al. reported a prevalence of 18.7% for typhoid fever among adults/children in North-Central Nigeria, as diagnosed by stool culture.

The variation in the findings this study may be attributed to factors such as geographical location, changes in laboratory capacity, the medical guidelines, and/or protocols, and budgetary restraints for blood culture could also be responsible. For example, underestimation bias from the use of only Widal-positive blood samples for cultures in most of the facilities due to the limited resources might make it possible to screen out positive typhoid [2]. This study revealed that there was increased in percentage of typhoid fever infection from 2018 to 2020.

This may add to factors such as increase in poor sanitation and personal hygiene, and lack of clean improved water. Resource and financial limitations are additional factors that account for the poor quality of water, sanitation, and hygiene infrastructure in Nigeria. There is a lack of political will on the part of water regulatory authorities such as States Water Corporations and Federal Municipal Water Agencies to monitor pipe water leakages and enforcement of existing laws on quality of water supply. Contamination of public water supplies from the few functional government water plants is still a common experience because of public vandals of water pipes, leakage of old unrepaired pipes, and particles from the water corporation [1][2].

### 4. Conclusion and Recommendation

In this study, it was observed that prevalence of typhoid fever was higher in blood culture widal test compared to previous studies done by stool culture and urine culture. It was found that there was increased in typhoid fever cases since 2018 to 2020. Lastly, poor sanitation and personal hygiene, and lack of clean improved water may responsible for increases typhoid fever. We recommended blood culture widal test, stool culture and urine culture should be used to test for typhoid fever. Health educators should educate rural communities important of proper sanitation and personal hygiene. Government should provide clean improved water available for the rural area.

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