International Journal of
Innovative Research in Technology, Basic and Applied Sciences
p-ISSN: 2465-7301 | e-ISSN: 2467-8171

IJIRTBAS
Vol. 6, No. 1
December, 2020

The Prevalence of Typhoid Perforation among Patients Attending Murtala Muhammad Specialist Hospital Kano State Northwest Nigeria

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Article DOI: 10.48028/iiprds/ijirtbas.v6.i1.07

Abstract

The purpose of this study was to investigate the prevalence of Typhoid Intestinal Perforation (TIP) among patients attending Murtala Muhammad Specialist Hospital Kano State Northwest, Nigeria. The study was a hospital based retrospective descriptive study of three-year record of Typhoid intestinal perforated patients admitted and treated at the specialist hospital 2016 – 2018. The study was guided by three research questions. Data were analyzed using descriptive statistics of frequency counts and percentages. The findings of the study revealed prevalence of 89 cases of typhoid intestinal perforated patients with an average of 30 patients per year. The study also showed more male patients were affected by typhoid intestinal perforation 48(54%) than females 41(46%). The study further revealed that majority of the patients were young male adults, and that the age affected were mostly between the ages of 10 to 20 years old. The study concluded that Typhoid perforation was prevalent and a major health problem in Kano State, Northwest, Nigeria. It was recommended that healthcare workers should organize health education to educate the public especially children, youth, and adults on the dangers of Typhoid perforation and measures to prevent it, prevention include observance of personal hygiene, environmental sanitation and provision of portable drinking water to the community.

Keywords: *Typhoid perforation, Murtala Muhammad Specialist Hospital Kano, Health education*

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Background to the Study

Significant research has documented the danger of Typhoid Intestinal Perforation (TIP) as a global public health concern, with high incidence of morbidity and mortality in developing countries particularly the tropical regions (Contini, 2017). TIP drains the individual, family and community scare resources due to its complications resulting into surgical intervention running into thousands of Naira to settle the operational, drugs and nursing care cost. To stem the tide of this culprit and the like of others such as COVID-19, pragmatic health education intervention measures must be embarked upon, in order to spare and sustained the individual, family and community's scarce human and material resources put to trial due to the negative effects and impacts of communicable disease.

Numerous studies have reported typhoid intestinal perforation as a common health problem in their studies. Contini (2017), Yan, Yang, Wang, Zhang, Zhou, Pang, Diao, Yan, Wu, Klena and Kan (2015) in China, Mogsale, Desai, Mogsale, Park, Ochiai, and Wierzba (2014) in a review on sub-Saharan Africa, Sheshe, Anyanwu, Mohammad, Muhammad and Obaro (2018), in Kano Nigeria, and Grema, Aliyu, Michael, Musa, Fikin and Abubakar (2018), documented an estimated occurrence of more than 33 million cases annually with more than 500, 000 mortalities. They explained it as a public health challenge among the most impoverished and overcrowded regions of developing world with poor sanitation and lack of access to safe drinking water.

In Nigeria, the higher morbidity and mortality rate is associated to lack of adequate clean drinking water, poor sanitation and lack of access to health facilities in remote areas and delay in hospital presentation. In kano state, Sheshe, Anyanwu, Mohammad, Muhammad and Obaro (2018), in a tertiary hospital observes that typhoid intestinal perforation (TIP) occasionally lead to typhoid intestinal perforation, and often surgical intervention is resorted, and due to the given the economic burden, this adversely affects the outcome of the patients and thus poses contemporary health challenges.

It is against this background that this study is undertaken to investigate the prevalence of typhoid intestinal perforation in Murtala Muhammed Specialist hospital in kano State. Hence, one of the strategies for economic recovery and sustainability is to embrace health education in the areas of prevention and control of communicable diseases such as Typhoid intestinal perforation, almost all the studies supported the use of health education to prevent the transmission of typhoid fever of which one of its complication results into typhoid intestinal perforation.

Purpose of the Study

The purpose of this study was to:

1. Investigate the prevalence of typhoid perforation in Murtala Muhammad Specialist Hospital Kano.
2. Assess the most common age range presented with typhoid perforation in Murtala Muhammad Specialist Hospital Kano.
3. Determine the gender commonly affected by typhoid perforation in Murtala Muhammad Specialist Hospital.

Research Question

1. What is the prevalence rate of typhoid perforation in Murtala Muhammad Specialist Hospital Kano?
2. What is the most common age range of patient with typhoid perforation in Murtala Muhammad Specialist Hospital?
3. Which gender recorded the highest rate of typhoid perforation in Murtala Muhammad Specialist Hospital?

Statement/Magnitude of the Problem

Typhoid perforation is one of the leading causes of morbidity and mortality to individuals, families and society. It was estimated occurrence of more than 33 million cases annually**.** Grema et. al (2018) explained that it is estimated that more than 33 million cases of typhoid fever occur annually causing more than 500, 000 deaths. The true incidence of complications is unknown, but alarming problems may arise in 10% to 15 % of patients, especially when the disease is lasting for two or more weeks, the case-fatality rate of 10%-30% without effective treatment, which may reduced to 1%-4% with prompt and appropriate management (Contini, 2017). Similarly, Kaljee, Pach, Garrett, Bajracharya, Karki and Khan (2018) revealed it burden to be 19.1 to 20.6 million cases annually with 200 000 to 600 000 death annually. Reddy, Shaw and Crump (2010) in a review found out that about 29.1% of blood stream infections were from *Salmonella enterica.*

In sub-Saharan Africa, Mogsale, Desai, Mogsale, Park, Ochiai, and Wierzba (2014) in a review estimated the overall average case fatality rate among hospitalized intestinal perforation cases to be 15.4% higher fatality rates in African region followed by Asia. Lee, Mogasale, Mogasale and Lee (2016) observed high knowledge gaps on the disease burden in many parts of developing countries. In West Africa, Sheshe, Anyanwu, Mohammad, Muhammad and Obaro (2018), reported that Nigeria records one of the highest rates, a double-digit mortality figure in the West African subregion globally as against single-digit mortality rates reported from more developed regions. Grema et al (2018) reported an incidence of 15% to 33% in West Africa.

Mogasale et al (2014) reported that the case fatality rate (CFR) in intestinal perforation is dependent on many factors like the quality of health care service received; characteristics of the organism and host factors. The diagnostic and therapeutic management for intestinal perforation have changed significantly over the past three decades which has potential implications on morbidity, mortality, hospital costs and societal costs.

Agu, Nzegwu and Obi (2014) in a retrospective study on 50 patients in University of Nigeria teaching hospital, Enugu found out 22 were males with highest rate in patients aged 20 years and younger. They also found out that those with three or more perforations and with increased pulse rate (tachycardia) and those with increased respiration tachypnea at presentation are at a higher risk of dying from the disease.

Concept of Typhoid Intestinal Perforation (TIP)

Ugochukwu, Amu and Nzegwu (2013) explained that typhoid fever, is a severe form of febrile illness caused primarily by a gram negative bacillus *Salmonella typhi*, which is generally transmitted by faeco-oral route and may occasionally lead to an epidemic, particularly in areas with poor sanitation and limited availability of clean, potable water.

Typhoid intestinal perforation is a potentially fatal complication of typhoid fever secondary to the inflammation and necrosis of Peyer's patches when not treated early and appropriately. Generally, perforation is a late complication occurring in the third week of illness, though it is reported earlier in second (Mogasale et. al, 2014).

However, Bulage, Masiira, Ario, Matovu, Nsubuga, Kaharuza, Nankabirwa, Routh and Zhu (2017) defined TIP as non-traumatic Intestinal Perforation as an onset of physician-diagnosed perforation in any part of the intestine of a patient who did not have a recent trauma or injury that could explain the perforation. A physician diagnosed perforation was defined as a non-traumatic hole in any part of the wall of the gastrointestinal tract which lines the stomach, small intestine or large bowel. A case of TIP was onset of non-traumatic IP in the terminal ileum of a physician-diagnosed typhoid patient.

Causes and symptoms and transmission of Typhoid fever

A large body of research has identified a number of factors as causes of TIP. Grema, (2018), Agu, Nzegwu and Obi (2014), Mogasale et al (2014), Chalya, Mabula, Koy, Kataraihya, Jaka, Mshana, Mirambo, Mchembe, Giiti and Gilyoma (2012), Kuubiere, Mogre, Majeed and Alhassan, 2015) showed the causes of Typhoid fever to be primarily a gram-negative bacillus Salmonella typhi; it outbreak was attributed to contaminated food and drinking water and is generally transmitted via faeco-oral route, may occasionally lead to an epidemic in areas with poor sanitation and limited availability to clean and portable water.

Yahaya (2019), explained the Symptoms as fever and abdominal pain, malaise, headache, sustained fever, constipation and/or diarrhea, and other gastrointestinal symptoms, cough and loss of appetite, confirmatory laboratory findings are conducted by the isolation of Salmonella Typhi from bone marrow, blood, or other site in a patient with compatible illness. However, in systemic involvement in typhoid fever can result in extra-intestinal complications such as encephalopathy, meningitis, hepatitis, myocarditis and pneumonia.

Prevention and control of Typhoid fever

Reviewed literature by (Suleiman (2018), Kabiru (2015), Okuofu (2015), Solhi, Abolfathi, Darabi, Mirzaei and Dadgar (2017), Kuubiere et al (2015) noted that effective public health education coupled with as the provision of clean, potable water and good waste disposal systems was what dramatically retarded the disease in developed countries.

Vaccination

Generally, experts such as (Debellut, Hendrix, Pitzer, Neuzil, Constenia, Bar-Zeev, Marfin and Pecenka (2019), Luthra, Watts, Debellut, Pecenka, Bar-Zeev and Constenla (2019), Srinivasan, Sindhu, John and Kang (2019), Contini (2017), Kabiru (2015), Rebmann and

Carrico (2017), Solhi, Abolfathi, Darabi, Mirzaei and Dadgar (2017), Suleiman (2018); Oyerinde (2019) emphasized vaccination as one of the most effective infection prevention measures critical to limit the disease transmission, protect individual and community especially typhoid conjugate vaccine (TCV):

1. Research in community health education, environmental and personal health especially on ways to improve on sanitation, improvement in the provision of portable drinking water and attention to personal hygiene are some of the methods capable of preventing the transmission of gram-negative bacillus Salmonella typhi, and generally by faeco-oral route.
2. Oral vaccine was found to be highly cost-effective when targeting ages 1-14 years in high-burden/high-risk districts in urban slums and rural areas without improved water in Asia.

   Health education in the community setting using effective modern methods in combination with health improvement approaches have greater impact in prevention and control thereby reducing the prevalence of emerging diseases, thus sustaining the scarce individual, family and community socioeconomic well being.

Methodology

The research design for this is study was retrospective descriptive. The study investigated the prevalence of typhoid perforated cases in MMSH. The record of all patients brought into the MMSH, with emergency typhoid intestinal perforation cases admitted and treated/operated between the months of June 2016 to April 2018 will include: patient, age, gender and. The extracted data included age and gender of all the patients operated for typhoid perforation in the hospital which were recorded in the theatre and the hospital records.

Presentation of results

A data sheet was designed which recorded the information from the hospital register. The data collected include patient age and gender was used.

Research Question One: What is the prevalence of typhoid perforation in Murtala Muhammad Specialist Hospital Kano?

Research Question two: What is the most common age range of patient with typhoid perforation in Murtala Muhammad Specialist Hospital?

Research Question three: Which gender recorded the highest rate of typhoid perforation in Murtala Muhammad Specialist Hospital?

Table 1: Age Ranges of Patients with Typhoid Intestinal Perforation

Age

Age range	Frequency	Percent
<10yr	14	15.4
11 - 20	42	46.2
21 - 30	26	28.6
31 - 40	8	8.8
41 Above	1	1.1
Total	91	100.0

Source: Murtala Muhammad Specialist Hospital Kano

Table 1 shows the age range with the highest case of Typhoid Intestinal Perforation were 11-20 years (46.2%) followed by age range 21-30 years 26(28.6%) while age group with lowest case were 41 above years 1(1.1%).

Figure 1.

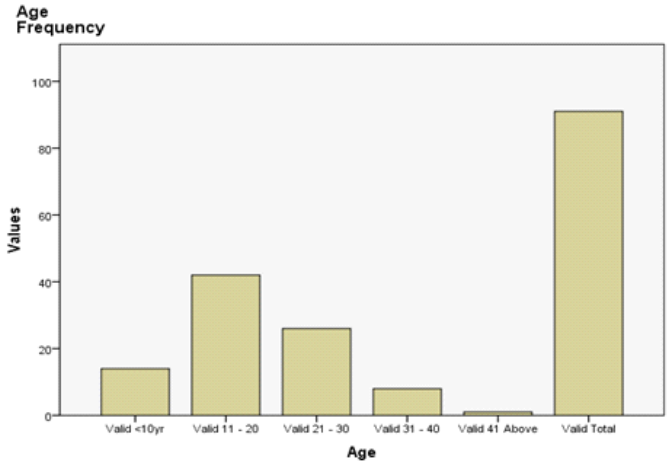


Table 2: Distribution of Typhoid Intestinal Perforation for three (3) years

Year

Years	Frequency	Percent
2016	24	26.4
2017	23	25.3
2018	44	48.4
Total	91	100.0

Source: Murtala Muhammad Specialist Hospital Kano

Table above showed year 2018 have the highest reported case of Typhoid Intestinal Perforation 44(48.4%), while the lowest case was 2017 with 23(25.3%)

Figure 2: Number of cases of Typhoid Intestinal Perforation

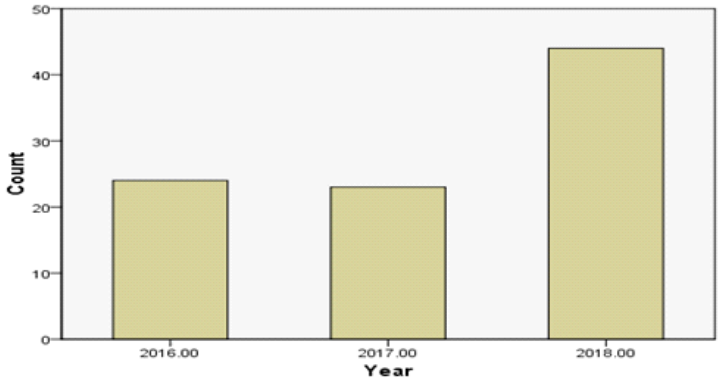


Table 3: Gender Distribution of Patient with Typhoid Intestinal Perforation

Gender

Gender	Frequency	Percent
male	47	51.6
female	44	48.4
Total	91	100.0

Source: Murtala Muhammad Specialist Hospital Kano

Table above shows majority the patients 47(51.6%) with highest proportion of patient with Typhoid Intestinal Perforation while female was 44(48.4%).

Figure 3: Number of cases of Typhoid Intestinal Perforation based on gender

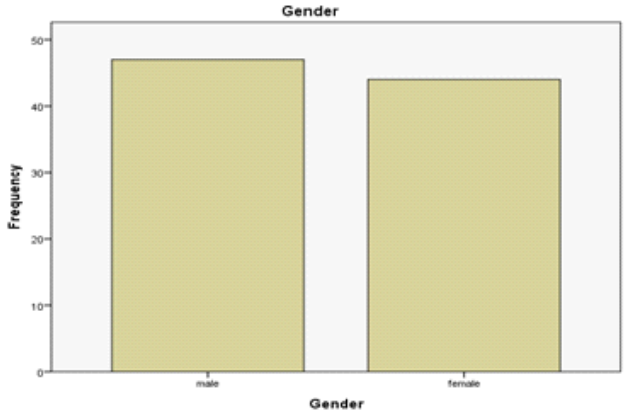


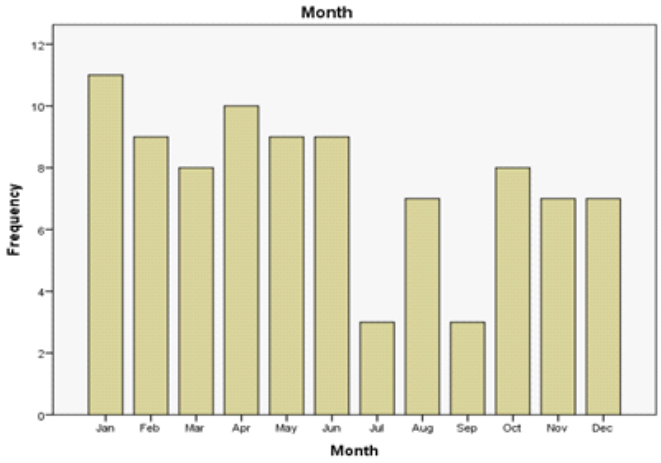
Table 4: Monthly Distribution of Patient with Typhoid Intestinal Perforation

Month		
Months	**Frequency**	**Percent**
Jan	11	12.1
Feb	9	9.9
Mar	8	8.8
Apr	10	11.0
May	9	9.9
Jun	9	9.9
Jul	3	3.3
Aug	7	7.7
Sep	3	3.3
Oct	8	8.8
Nov	7	7.7
Dec	7	7.7
Total	91	100.0

Source: Murtala Muhammad Specialist Hospital Kano

Table above shows the month with highest cases January 11(12.1%), then April 10(11.0%) and the month with lowest case were recorded in the month of July and September 3(1.9%).

Figure 4.



Discussion

The finding of this study revealed eighty-nine (89) cases of Typhoid intestinal perforation (TIP) in MMSH. This study is in line with the finding of (Chalya et. al (2012), Agu et al (2014), Mogasale et. al (2014), Sheshe (2018), Yan et al (2015), Bulage et. al (2017), Grema et. al (2018), Ugochukwu et al (2013) which indicated the prevalence of typhoid intestinal perforation.

The highest age group showed more than half were within the age of 10 to 20 years old. This study agrees with the works of (Nuhu, Dahwa and Hamza (2010), Osifo and Ogiemwonyi (2010), Chalya et. al (2012), Agu et. al (2014), Kuubiere et. al (2015), Grema et. al (2018), Sharma et al (2013), Sheshe et. al (2018), who documented majority of young people and adult. This finding is worrisome looking at the patients' age is within the productive period they should either be in school pursuing a career or at a place of apprenticeship learning a trade or at the farm helping their family in the farm or fishing. This disease has cut an ambition which the family and community expect to contribute to the socio economic development and wellbeing of their families and communities, are now becoming burden to families and communities.

Again, another objective is to find out gender with highest admitted rate on account of Typhoid intestinal perforation, this study showed that more male patients were affected with TIP 48(54%) than females 41(46%). The finding of this study is in line with work of (Mogsale et. al (2014), Kuubiere et. al (2015), Bulage et. al (2017), Grema et. al (2018), Sheshe et. al (2018), which showed that majority of TIP case-persons were of the male gender. Which gender recorded the highest rate of typhoid perforation in Murtala Muhammad Specialist Hospital?

Ethical approval

Ethical approval was obtained from the Kano state operational research sub-committee Ministry of Health Kano.

Limitations of the study

The study is retrospective and hospital based, the findings were based on theatre and hospital health record unit report, there is the possibility of missing of patient records, as most of TIP report was based on the information obtained from these record.

Conclusion

Typhoid intestinal perforation still remain a major public health problem in kano state which affects majorly one of the most productive human resource of any community the male gender and mostly presented among children and the youth with a proportion of adult age ranged between 10 to 30 years old.

Recommendations

Based on the conclusions drawn, it was recommended that:

1. Government should ensure the provision of safe and portable drinking water.
2. The government should enforce regulations on food and beverages comply with all safety measures while preparing and processing food for public consumption.
3. The government should provide hospitals' laboratory with basic test kids to detect typhoid early.
4. The health care workers should employ health education strategies through the use of social media such as whatsapp, facebook, telegram and skype to disseminate information on preventive measures against typhoid fever, educate all patients and patients' significant others at the outpatient on the dangers of typhoid.

5. The healthcare workers should extend health education campaign in the media on the prevalence of typhoid and its one of its major complication intestinal perforation.

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