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PREVALENCE OF SALMONELLA ENTERICA IN NIGERIA

Introduction

The gram-negative, motile rod, facultative anaerobe genus Salmonella is non-sporing and non-capsulated. In terms of taxonomy, it comes from the enterobacteria family, which has two major species: enterica and bongori. Arizonae, diarizonae, indica, houterae, salamae, and enterica are the six subspecies of Salmonella enterica. Typhi, paratyphi, and entereditis comprise the more than 2600 serotypes of Salmonella enterica enterica, according to the Kauffman White classification based on the Somatic O-Ag, Flagella H-Ag, and Capsular Vi-Ag [1].

With 93.8 million cases of gastroenteritis and almost 155,000 fatalities annually, salmonella infections continue to be the most common cause of foodborne illnesses worldwide. Of these, about 80 million cases (85%) are linked to contaminated food, especially chicken, eggs, pork, and dairy products [1]. In 2021, invasive Salmonella infections emerged as a significant public health concern, accounting for approximately 510,000 cases. Sub-Saharan Africa and infants under one year old had the highest disease incidence and disability-adjusted life years (DALYs) [1]diagnostic gaps, and challenges in Nigeria.Methods Using a retrospective study, we analysed a total of 84,548 culture results from 26,630 patients across 25 public laboratories participated in the AMR surveillance report from Nigeria. Salmonella species and stool culture positivity rates were compared throughout the 3 years period. Stool sampling gaps were quantified and Salmonella species AMR for key antibiotic classes were assessed. Chi-square test and Wald risk ratios (RR.

Due to the extensive and high-rate cattle rearing system, which is mostly practiced by the Fulani and Hausa people of the country's north, beef is the main source of meat in Nigeria [2]. Suya, a popular meat delicacy in Nigeria, is one of the many traditionally processed meat preparations that are currently consumed in several nations. "Suya" is a classic barbecue that can be roasted or smoked [2]. It is created from thinly sliced boneless meat that has been marinated with a variety of spices, including garlic, ginger, pepper, salt, peanut cake, and vegetables [2]. Due to the fact that this meat delicacy is typically prepared in unsanitary settings, it is vulnerable to many viruses that might cause salmonella.

Salmonella infections are underreported in Nigeria because people, particularly those who live in rural areas, lack access to adequate healthcare facilities, do not seek medical attention, and do not self-medicate [3]. The emergence of antimicrobial resistance (AMR) in Salmonella infections has grown to be a serious worldwide health issue, with endemic West African areas like Nigeria seeing very dire health consequences [4]. According to a 2021 study by Akinyemi, over 60% of Salmonella isolates showed multidrug resistance, and between 1999 and 2018, the prevalence rates of gastroenteritis and bloodstream infections in Nigeria were 16.3% and 1.9%, respectively, based on culture-confirmed data [4]. An estimated 325,731 human cases of non-typhoidal salmonella (NTS) and 1,043 fatalities were reported in 2020.

Goal

The objective of this study is to assess the prevalence of salmonellosis in Nigeria and identify factors influencing the spread of the disease.

Material and methods of research

Data was collected from research studies in Nigeria that report on cases of salmonellosis.

The results of the research and their discussion

Salmonella infections are underreported in Nigeria because people, particularly those who live in rural areas, lack access to adequate healthcare facilities, do not seek medical attention, and do not self-medicate. According to a 2021 study by Akinyemi, over 60% of Salmonella isolates showed multidrug resistance, and the prevalence rates of gastroenteritis and bloodstream infections in Nigeria were 16.3% and 1.9%, respectively, based on culture-confirmed data. Non-typhoidal salmonella (NTS) was expected to have caused 325,731 human cases in 2020, with a mortality rate of 1,043 deaths, or 37,321 disability-adjusted life years. The incidence of salmonella in individual samples from chicken farms was reported to be 15.9%, while a range of 39.7% to 48.3% of poultry farms tested positive for salmonellosis (non-typhoidal salmonella). Salmonella was found in 10.7% of transit cartons containing day-old chicks from large hatcheries, according to another investigation. According to another pertinent study, there were 188,694 cases (57.9%) among those in the poultry value chain and 137,037 cases (42.1%) among those who consumed poultry and poultry products. Furthermore, from January to December of 2020, 43,662,085 poultry (chickens) were engaged in the outbreaks, resulting in 15,841,044 deaths, 20,574,302 salvage slaughters, 5,713,152 culls, and 1,533,587 unaccounted-for chickens.

Ninety-six (96) samples of street-vended ready-to-eat meats (suya), spices (yaji), hand swabs from vendors, and cutting or slicing blades totalling 384 samples were collected from five locations in Minna Metropolis. 13% of the 384 samples had Salmonella enterica, with suya meat having the highest prevalence (26%) and yaji and hand samples having the lowest (9% each). The whole details of the study's findings are provided in the table below:

Table 1 – Prevalence of Salmonella enterica in suya and its contact surfaces in Minna

Suya and its contact surfaces	Prevalence (%)
Suya meat	26
Spices(yaji)	9
Knives for cutting suya meats	10
Hands of suya meat sellers	9
Overall	13

Due to inadequate education and awareness, Salmonella enterica is more common in rural Nigeria (23.1%) than in urban areas (17.9%). One study found that the infection is more common in children under the age of five (28.2%).

Over the past 20 years, Belarus has seen a moderate decline in the prevalence of the salmonellosis epidemic, with incidence rates ranging from 30 to 55 cases per 100,000 people. The incidence rate in 2022 was about 25 instances per 100,000 people, which was the same as it was in 2021. The salmonella microbiome is home to approximately 40 different serotypes each year, although the S. enteritidis serotype is responsible for more than 78% of infections. All age groups had salmonellosis, with children under the age of five having a greater prevalence of 53.8%. The older age group, particularly the retired (>65 years old), had the lowest prevalence (6%), but because of their lowered immunity, they experienced more severe symptoms. Over 85% of instances are documented among city dwellers, indicating a higher risk of illness. The capital, which accounts for 57.4% of all cases in the republic, and regional centers have

historically had higher incidence rates. Numerous variables contribute to this distribution, such as the highly centralized manufacturing of food goods and raw materials, population density, a sophisticated public catering network, eating patterns, and variations in healthcare utilization.

According to microbiological monitoring data, an epidemiological study of salmonella outbreaks found the source of infection in 96.6% of cases, with foodborne transmission accounting for the vast majority of infections (92.7%). Salmonella was therefore most frequently found in meat and meat products (64% of all positive samples) and eggs and egg products (21% of all positive samples) when food raw material and food product samples were tested in 2022. Household contact was the mode of infection transmission in 3.9% of cases. When caring for young children, personal hygiene practices were typically neglected, which led to household contact transmission. Over 90% of people develop the infection at home.

Conclusion

The data highlights a significant public health challenge posed by salmonella in Nigeria, exacerbated by underreporting, limited healthcare access, and widespread contamination throughout the poultry value chain and food markets. Rural populations and vulnerable groups, such as young children, face higher risks, compounded by poor hygiene practices and inadequate awareness. Conversely, Belarus exhibits a more controlled epidemiological trend, with foodborne transmission primarily linked to meat and eggs, underscoring the importance of food safety protocols.

Addressing these issues requires a multifaceted approach, including strengthening surveillance systems, improving hygiene and safety standards at all production and handling stages, and raising public awareness, particularly in rural areas. Combating multidrug-resistant strains also demands prudent antibiotic use and targeted research. Ultimately, coordinated efforts across health, agriculture, and education sectors are essential to reduce the burden of salmonella infections and safeguard public health in Nigeria and similar settings.

LITERATURE

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