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Typhoid Fever: An Emerging Global Threat

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Abstract

Typhoid fever, a formidable infectious disease, is caused primarily by the cunning bacterium known as Salmonella Typhi. This stealthy pathogen often finds its way into our bodies through tainted food and water, setting the stage for a grave public health challenge. Once inside, the Salmonella Typhi bacteria embarks on a dangerous journey, infiltrating our bloodstream and unleashing a host of distressing symptoms, with potentially life-threatening consequences. In this paper, we delve into the ever-evolving world of typhoid fever, paying close attention to how urbanization and climate change are transforming the landscape and amplifying its worldwide reach. Understanding the titer value allows for the full and accurate analysis of a Widal test. To acquire the typhoid test report, a good diagnosis requiring titers in the range of 1:20, 1:40, 1:60, 1:80, 1:160, and 1:200 is made.

Keywords

Salmonella typhi, Lymph node, typhoid virus, typhus virus, citrobacter.

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1. Introduction

Figure 1. Salmonella bacterium

Infectious diseases have long been a major concern in global public health, with their impact spanning centuries and continents. Among these, typhoid fever, caused predominantly by the bacterium Salmonella Typhi, stands as a persistent and potentially deadly menace. Despite considerable advances in medicine and sanitation, typhoid fever remains a significant global health threat, affecting millions of people annually, particularly in regions with limited access to clean water and proper sanitation facilities.

The gravity of typhoid fever lies not only in its immediate health consequences but also in its potential for widespread transmission, economic burden, and long-term complications. This paper aims to illuminate the contemporary status of typhoid fever as an evolving global threat, shedding light on the multifaceted factors contributing to its persistence and resurgence. By examining its epidemiology, modes of transmission, antibiotic resistance patterns, and the synergistic effects of urbanization and climate change, we seek to provide a comprehensive understanding of the complex web surrounding this disease.

Historically, typhoid fever has been closely associated with poor sanitation and hygiene conditions. The transmission of Salmonella Typhi typically occurs through the ingestion of contaminated food or water, making it a prime example of a waterborne and foodborne illness. Overcrowded urban areas, where access to clean water and sanitation services is often limited, become hotspots for typhoid outbreaks. As urbanization continues to surge, the vulnerability of populations living in these conditions to typhoid fever remains a concerning aspect of the global health landscape.

Complicating the fight against typhoid is the emergence and spread of antibiotic-resistant strains of Salmonella Typhi. This resistance undermines the efficacy of traditional treatment methods and further intensifies the urgency of implementing effective disease management strategies. The intricate interplay between antibiotic resistance, urbanization, and climate change requires meticulous examination to develop nuanced approaches for containment and prevention.

Urbanization, with its rapid population growth and shifting demographics, creates novel challenges in the context of typhoid control. As cities expand and urban slums proliferate, the risk of typhoid transmission escalates, particularly among marginalized communities. Simultaneously, climate change adds an additional layer of complexity by altering the geographic distribution of vector organisms and potentially expanding the range of Salmonella Typhi. These evolving dynamics necessitate a proactive and adaptive response to mitigate the global prevalence of typhoid fever.

It is also unusual where water is treated to reduce microorganisms and human waste disposal is regulated. Typhoid fever is a rare condition in some countries, including the United States. The continents having the most cases or regular outbreaks include Africa and South Asia. It poses a serious health risk in locations where it is more prevalent, especially for children.

In the following sections of this research paper, we will delve into the various facets of typhoid fever, exploring its epidemiological trends, the mechanisms of its transmission, the alarming rise in antibiotic resistance, and the converging influence of

urbanization and climate change. By comprehensively analyzing these factors, we aim to provide a foundation for evidence-based interventions and policy recommendations that address typhoid fever as an emerging global threat. It is our hope that this research contributes to the ongoing efforts to curb the spread of this insidious disease and protect the health and well-being of populations worldwide.

2. Causes

Consuming contaminated food, drinks, or water is how S typhi is spread. If you eat or drink something that has germs in it, they get into your body. Prior to entering your blood, they pass through your intestines. Your lymph nodes, gallbladder, liver, spleen, and other organs are all reached by them via the blood.

3. Symptoms

Confusion, delirium, and hearing or seeing things that are not there are symptoms of hallucinations.

- Inability to concentrate (attention deficit disorder):
- Extreme exhaustion
- Slow, sluggish, feeble sensation
- Slow, sluggish, weak feeling

4. Treatment

You can be urged to drink water with electrolyte packets, or you might receive fluids and electrolytes by IV (into a vein). To kill the germs, antibiotics are used. Antibiotic resistance rates are rising globally, therefore before recommending an antibiotic, your clinician will review the most recent recommendations.

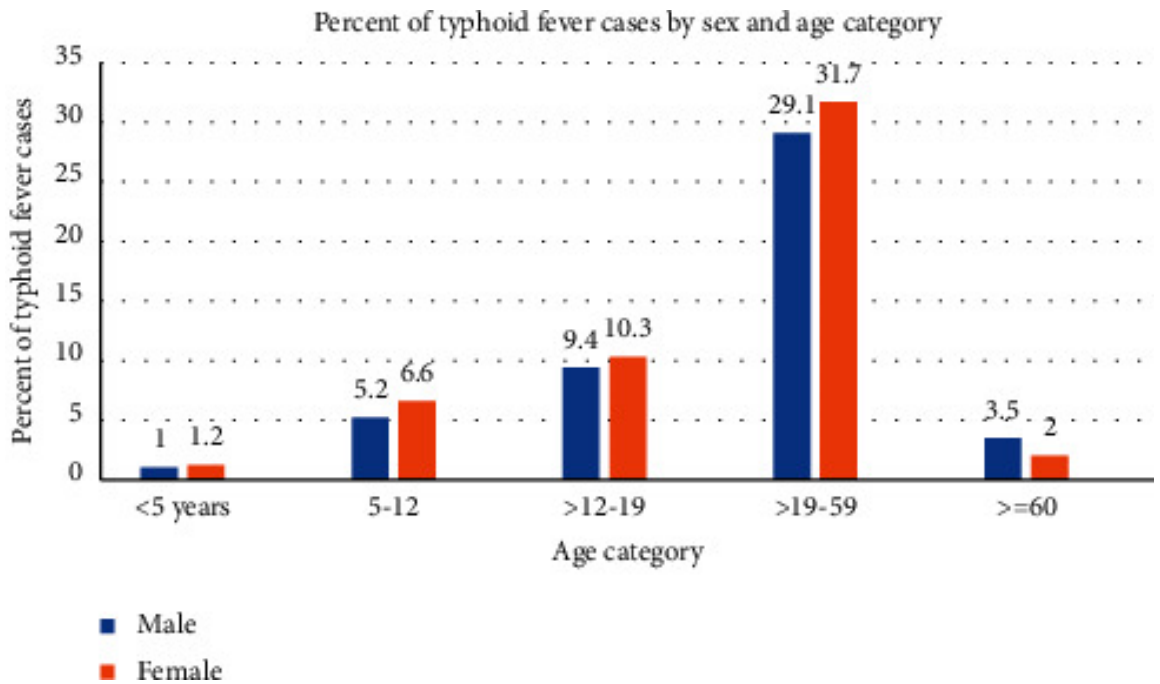

Figure 2 Shows the distribution of cases of typhoid fever from 2015 to 2019 by sex and age group in the Jimma Zone, Oromia Region, Southwest Etopia

4.1 Possible Complications

- The following health issues can arise:
- Kidney failure.
- Peritonitis.
- Kidney hemorrhage (severe GI bleeding); Intestinal perforation

5. STATISTYCAL ANALYSIS: Distribution of Typhoid Fever by Person

The study comprised all of the surveillance data that were collected between January 2015 and December 2019 and meet the qualifying requirements. From 2015 to 2019, 36,641 cases of typhoid fever were reported. 18,972 of these (51.8% of the total) were female, while 17,669 (48.2%) were male. Typhoid fever cases were most prevalent among study participants aged 19 to 59, where they totaled 22,300 (60.8%) cases.

Table 1 shows the incidence of typhoid fever by year from 2015 to 2019 in the Jimma Zone, Oromia Region, Southwest Ethiopia.

Years	Risk Population	Amount of cases	Count of fatalities	Cases percentage(%)	Rate of occurrence (cases/100,000)
2015	28,63,762	6,182	0	17	216
2016	29,76,050	5,874	0	16	198
2017	30,88,338	6,265	0	17	203
2018	32,00,626	8,421	0	23	164
2019	33,12,914	9,899	0	27	299
Total	1,54,41,690	36,641			

5.1 Material and Methods

A multidisciplinary team of researchers has developed a novel technique for detecting typhoidal Salmonella infections. In countries where typhoid is an issue, this approach will significantly help vaccination planning. The innovative technique identifies typhoid antibodies in dried blood spots. Contrary to blood cultures, disease detection in rural areas is simpler and quicker. There are authors on the study's collaboration from Bangladesh, Nepal, Pakistan, Ghana, Canada, South Korea, England, and Germany. Published in The Lancet Microbe.

Additionally, the researchers developed algorithms to recognize the onset of typhoid, allowing them to monitor the disease's occurrence in communities over time.

They achieved this by assessing antibody responses in a population-based sample of 1,740 children and young adults from Nepal, Pakistan, Bangladesh, and Ghana. When they contrasted their findings with previously gathered blood culture data, they found that the real number of typhoid illnesses was much greater across all countries and areas. Instead, than just taking a sample, examining the person's antibody response, and declaring whether they are negative or positive, said Aiemjoy, "we can simulate the antibody degradation." The decay rate provides important information on the severity of the infection, allowing us to pinpoint when those individuals were most likely exposed.

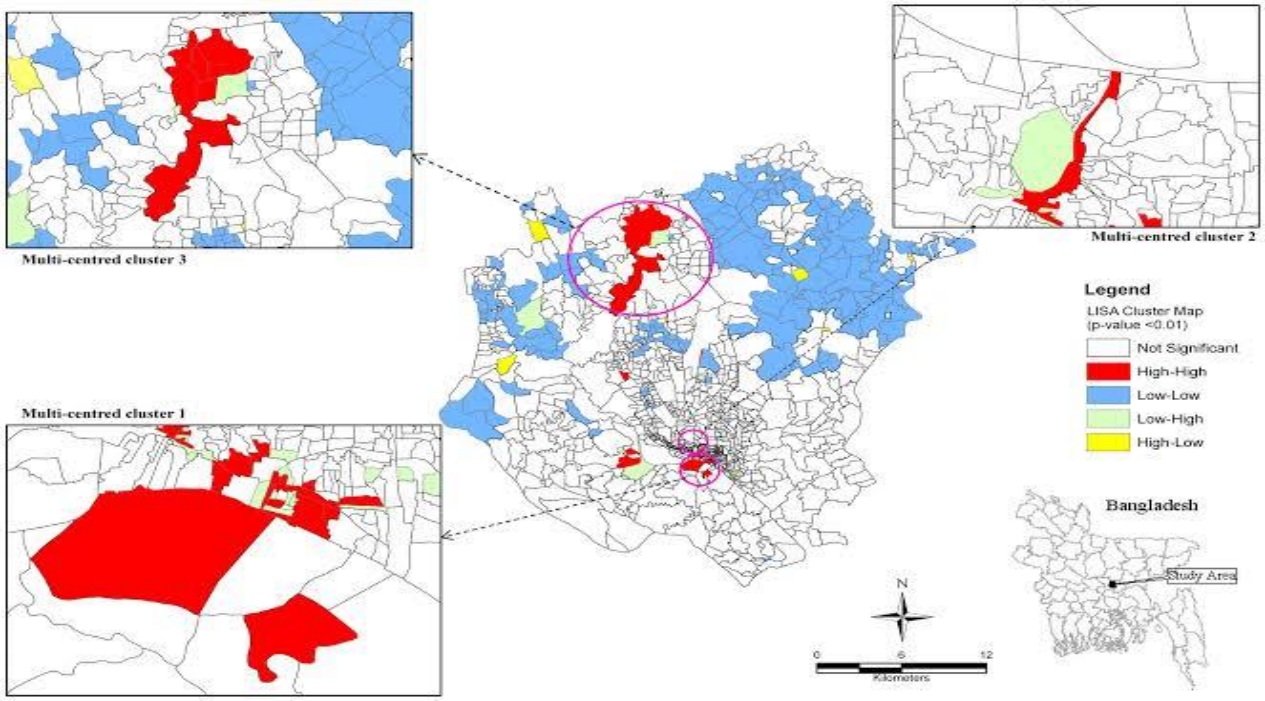

Figure 3 Worldwide scale

6. Result

In all, 36,641 people contracted typhoid fever over the course of five years. 18,972 of these (51.8% of the total) were female, while 17,669 (48.2%) were male. Typhoid fever incidence was discovered to be as follows: In 2015, 2016, 2017, 2018, and 2019, there were 216, 198, 203, 264, and 299 cases per 100,000 people, respectively. From 2015 to 2019, there was an increase in typhoid fever cases of 1.4. At the beginning of the rainy months, a high incidence of instances was seen. The majority of the cases under investigation were found in the Kersa, Gomma, and Mana woredas (4,476 (12.2%), 4,075 (11.1%), and 3,267 (8.9%), respectively. 151 (0.4%) of the reported cases overall were hospitalized for inpatient treatment. Death was not reported from all woredas over the course of the five years of surveillance data.

7. Discussion

The incidence of typhoid fever in the Jimma Zone was examined using surveillance data during a five-year period (2015–2019). Good quality was present in the report. 238 cases of typhoid fever per 100,000 individuals occurred in the five-year period (2015-2019).

In 216 cases in 2015, 198 cases in 2016, 203 cases in 2017, 264 cases in 2018, and 299 cases in 2019, it was determined that 100,000 people were affected by typhoid fever.

The burden of typhoid fever cases increased from 2015 to 2019 with a shifting pattern, the findings showed, despite numerous interventions being implemented in the catchment area. A study conducted in West Wollega, Ethiopia's Lalo Asabi district, revealed that the trend was escalating in an unpredictable way.

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Typhoid fever cases in the Jimma Zone can rise as a result of years of growth in the number of hospitals, clinics, and other healthcare facilities.

8. Conclusion

In the Jimma Zone, typhoid fever has been a significant public health problem for the past five years, and it is only getting worse. The zonal health departments should enhance the interventions aimed at the woredas where typhoid fever was prevalent at the start of the rainy season. Using surveillance data gathered over a five-year period (2015-2019) in the Jimma Zone, this study assessed the incidence of typhoid fever by individual, location, and time.

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Conflict of Interest

There was no conflict of interest among anyone as per the research.

References

1. Acharya IL, Lowe CU, Thapa R, Gurubacharya VL, Shrestha MB, Cadoz M, et al. Prevention of typhoid fever in Nepal with the VI capsular polysaccharide ofsalmonella typhi. N Engl J Med [Internet]. 1987;317(18):1101–4. Available from: http://dx.doi.org/10.1056/nejm198710293171801
2. Antillón M, Bilcke J, Paltiel AD, Pitzer VE. Cost-effectiveness analysis of typhoid conjugate vaccines in five endemics low- and middle-income settings. Vaccine [Internet]. 2017;35(27):3506–14. Available from: http://dx.doi.org/10.1016/j.vaccine.2017.05.001
3. Arjyal A, Basnyat B, Nhan HT, Koirala S, Giri A, Joshi N, et al. Gatifloxacin versus ceftriaxone for uncomplicated enteric fever in Nepal: an open-label, two-centre, randomized controlled trial. Lancet Infect Dis [Internet]. 2016;16(5):535–45. Available from: http://dx.doi.org/10.1016/s1473-3099(15)00530-7.
4. Azmatullah A, Qamar FN, Thaver D, Zaidi AKM, Bhutta ZA. Systematic review of the global epidemiology, clinical and laboratory profile of enteric fever. J Glob Health [Internet]. 2015;5(2). Available from: http://dx.doi.org/10.7189/jogh.05.020407.
5. Bhutta ZA. Impact of age and drug resistance on mortality in typhoid fever. Arch Dis Child [Internet]. 1996;75(3):214–7. Available from: http://dx.doi.org/10.1136/adc.75.3.214.
6. Breiman RF, Cosmas L, Njuguna H, Audi A, Olack B, Ochieng JB, et al. Population-based incidence of typhoid fever in an urban informal settlement and a rural area in Kenya: Implications for typhoid vaccine use in Africa. PLoS One [Internet]. 2012;7(1):e29119. Available from: http://dx.doi.org/10.1371/journal.pone.0029119.
7. Gilman RH, Hornick RB, Woodward WE, DuPont HL, Snyder MJ, Levine MM, et al. Evaluation of a UDP-glucose-4-epimeraseless mutant of salmonella typhi as a live oral vaccine. J Infect Dis [Internet]. 1977;136(6):717–23. Available from: http://dx.doi.org/10.1093/infdis/136.6.717.

8. Britto C, Pollard AJ, Voysey M, Blohmke CJ. An appraisal of the clinical features of pediatric Enteric fever: Systematic review and meta-analysis of the age-stratified disease occurrence. Clin Infect Dis [Internet]. 2017;64(11):1604–11. Available from: http://dx.doi.org/10.1093/cid/cix229.

9. Carias C, Walters MS, Wefula E, Date KA, Swerdlow DL, Vijayaraghavan M, et al. Economic evaluation of typhoid vaccination in a prolonged typhoid outbreak setting: The case of Kasese district in Uganda. Vaccine [Internet]. 2015;33(17):2079–85. Available from: http://dx.doi.org/10.1016/j.vaccine.2015.02.027.

10. Cook J, Jeuland M, Whittington D, Poulos C, Clemens J, Sur D, et al. The cost-effectiveness of typhoid Vi vaccination programs: Calculations for four urban sites in four Asian countries. Vaccine [Internet]. 2008;26(50):6305–16. Available from: http://dx.doi.org/10.1016/j.vaccine.2008.09.040

11. Crump JA, Sjölund-Karlsson M, Gordon MA, Parry CM. Epidemiology, clinical presentation, laboratory diagnosis, antimicrobial resistance, and antimicrobial management of invasive salmonella infections. Clin Microbiol Rev [Internet]. 2015;28(4):901–37. Available from: http://dx.doi.org/10.1128/cmr.00002-15

12. Darton TC, Jones C, Blohmke CJ, Waddington CS, Zhou L, Peters A, et al. Using a human challenge model of infection to measure vaccine efficacy: A randomised, controlled trial comparing the typhoid vaccines M01ZH09 with placebo and Ty21a. PLoS Negl Trop Dis [Internet]. 2016;10(8):e0004926. Available from: http://dx.doi.org/10.1371/journal.pntd.0004926.

13. Feasey NA, Gaskell K, Wong V, Msefula C, Selemani G, Kumwenda S, et al. Rapid emergence of multidrug resistant, H58-lineage salmonella typhi in Blantyre, Malawi. PLoS Negl Trop Dis [Internet]. 2015;9(4):e0003748. Available from: http://dx.doi.org/10.1371/journal.pntd.0003748.

14. Gaind R, Paglietti B, Murgia M, Dawar R, Uzzau S, Cappuccinelli P, et al. Molecular characterization of ciprofloxacin-resistant Salmonella enterica serovar Typhi and Paratyphi A causing enteric fever in India. J Antimicrob Chemother [Internet]. 2006;58(6):1139–44. Available from: http://dx.doi.org/10.1093/jac/dkl391.

15. Gilman RH, Hornick RB, Woodward WE, DuPont HL, Snyder MJ, Levine MM, et al. Evaluation of a UDP-glucose-4-epimeraseless mutant of salmonella typhi as a live oral vaccine. J Infect Dis [Internet]. 1977;136(6):717–23. Available from: http://dx.doi.org/10.1093/infdis/136.6.717.