

Prevalence of *Salmonella typhi* and pharmacotherapy outcomes among children in ten years in Hilla city, Iraq

Nada Khazal Kadhim Hindi ^{1,*}, Shatha Khazal Kadhim Hindi ², Mohammed Malih Radhi ³, Abdolmajid Ghasemian ⁴

¹Department of Basic and Medical Science, College of Nursing, Babylon University, Babylon Province, Iraq

²Fatima Al- Zahraa hospital, Iraq

³Community Health Nursing, Kut Technical Institute, Middle Technical University, Iraq

⁴Department of Bacteriology, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran

*Corresponding author: Nada Khazal Kadhim Hindi, Department of Basic and Medical Science, College of Nursing, Babylon University, Babylon Province, Iraq. E-mail: nadakhzal@yahoo.com

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ABSTRACT

Typhoid fever diseases menace the human health worldwide. This study assessed the prevalence of typhoid fever among children in Hilla City. A total of 217 samples were collected. Children were diagnosed with pyrexia caused by *S. typhi* by records of medical used for statistical study tools considered. Most of patients aged 1-4 years and were male (54.4 %). Interestingly, our findings unraveled an increasing trend between 2014 and 2015, decreasing during 2015-2016 but a sharp increase during 2016-2018. Public health interventions need to be under consideration to hinder the spread of infection. Studies of healthcare and proper pharmacotherapies would help to develop better control systems and comparison between urban and rural areas of infection.

Keywords: Typhoid Fever, children under ten years, Hilla

INTRODUCTION

Typhoid fever is an acute systemic diseases caused by *Salmonella enterica* subspecies serovar Typhi. The disease is characterized by fever, headache, tightness, loss of

appetite, slow relative heart, constipation or diarrhea and cough reproduction [1].

Typhoid fever is a systemic infection that is an important source of illness and death in low-resource areas. Intestinal fever (typhoid, typhoid fever) caused by infection of the

intestinal *Salmonella typhi* (*S. typhoid*) and intestinal struck *S. typhi*. *S. typhi* A and B (abnormal, *S. typhi* C) cause disease can not be clinically distinguished from typhoid fever, especially in parts of Asia. Lack of enough sanitation facilities and exposure to contaminated water and food predispose to infection [2,3]. Furthermore, invasive salmonella infections are responsible for a significant burden of morbidity and mortality worldwide. There are an estimated 11 to 21 million cases of typhoid fever and about 128,000 to 200,000 deaths per year. Most cases occur in South, Southeast Asia and Sub-Saharan Africa [4,5]. Without treatment, the mortality rate of typhoid fever is 10-30 %, and mitigates to 1-4 % with appropriate pharmaceuticals. Hence, timely antibiotic therapy is essential to hinder complications such as intestinal perforation and death [6]. Young children are the most vulnerable population. Common symptoms include persistent fever, chills and abdominal pain. Symptoms include a complexity of the clinical diagnosis, similar to those from other diseases. However, the mainstay of the laboratory confirmation is the blood [7]. Recent data has indicated that the annual burden of disease reaches 21 million cases worldwide with more than 200,000 deaths due to typhoid fever [8]. The incidence of typhoid fever is higher in Asia

with 93 % of global cases. It also has the highest mortality rate being 274 cases per 100,000 individuals, being five times higher than the second highest rate in Latin America. In Southeast Asia, this rate is 110 cases per 100,000 population, which is the third highest rate such as in Pakistan [9]. The typhoid fever incidence follows a declining trend among countries and regions. Contemporary estimates of the incidence of typhoid fever are helpful in supporting countries' decision making about typhoid prevention. This study was conducted to identify the prevalence of typhoid fever caused by *Salmonella Typhi* among children less than 10 years in Hilla City, Iraq.

MATERIALS AND METHODS

Population and sampling

A descriptive (retrospective) study design was conducted to identify the prevalence of typhoid fever associated to *Salmonella Typhi* among less than 10 years children. All patients <10 years having symptoms of typhoid admitted to the healthcare settings were included. A total of 217 samples were collected during 2014-2018. For all years for children diagnosed with typhoid fever caused by *Salmonella Typhi*, the medical records of statistics were considered.

RESULTS

Prevalence and trend of typhoid fever

Our results revealed that the highest prevalence rate was recorded in 2018 (49.8 %) during the past five years, with the increase with the years, and decreases the low level of services. Most of patients aged 1-4 years and were male (54.4%).

Interestingly, our findings unraveled an increasing trend between 2014 and 2015, decreasing during 2015-2016 and a sharp increase during 2016-2018 (Figures 1 and 2).

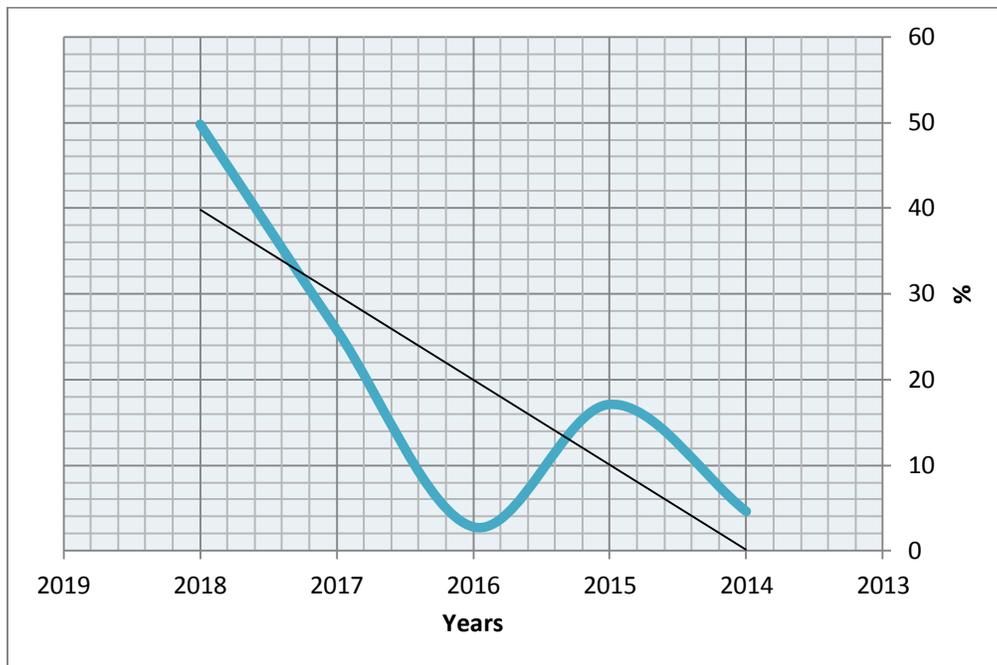


Figure 1. Typhoid fever caused by *typhoid Salmonella* has spread according to years.

DISCUSSION

Bacteria cause typhoid, typhoid fever (*Salmonella Typhi*) is rare in industrialized countries. However, the disease still poses a threat for health in developing countries, especially among children [10]. It is transmitted through contaminated food or drink or direct contact with an infected person. Signs and symptoms usually include fever, headache, abdominal pain, either constipation or diarrhea [11]. According to our results, typhoid fever

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increased gradually from 2014-2018 but was sharply enhanced during 2016-2018. A total of 26.9 million cases of typhoid fever were reported in 2010 worldwide. In developed countries, the rate of infection per 100,000 people a year, ranges from less than 0.1-0.3, and the disease affects primarily people who travel to the affected areas in low- and middle-income countries due to clean water and adequate sanitation shortage [12].

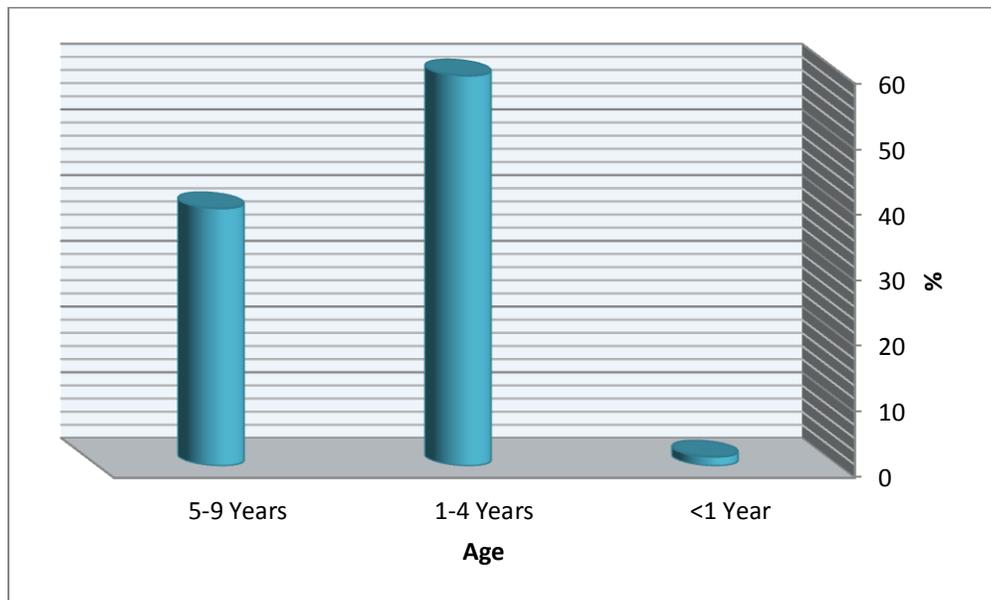


Figure 2. Typhoid fever caused by *Salmonella typhoid* is spread according to age

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The rate of typhoid fever caused by *Salmonella Typhi* was highest in age range between 1-4 years in our study. The findings come in the same context with a cross-sectional study in the Faculty of Medicine Sir Salem God, Dhaka, Bangladesh revealed *Salmonella Typhi* prevalence among blood samples of male patients as 15.1% out of 126 cases [13]. Furthermore, it has been conducting surveillance of communicable diseases on the basis of the population in Nairobi, Kenya, and confirmed that the system of *Salmonella typhi* (typhoid fever) transmitted in children less than ten years mediated more environmentally friendly than those in adolescence and adult stage [14]. In our study, infected children health outcomes were mostly recovered by pharmacotherapy with efficient antibiotics. These included gentamicin, imipenem, meropenem, ciprofloxacin, cefixime and ceftazidime.

CONCLUSION

Most of patients in this study aged 1-4 years and were male (54.4%). Noticeably, our findings unraveled an increasing trend between 2014 and 2015, decreasing during 2015-2016 and a sharp increase during 2016-2018. Public health interventions should be under consideration to hinder

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the spread of infection. Studies of healthcare and proper pharmacotherapies would help to develop better control systems and comparison between urban and rural areas of infection.

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