



THE PREVALENCE OF TYPHOID FEVER AMONG DIFFERENT SOCIO DEMOGRAPHIC CATEGORIES AND GENDERS

Safdar Ali Pervez^{1*}, Zahid Hussain², Naeema Asghar³, Farukh Imtiaz⁴, Kaneez Fatima⁵,
Bakhtiar Ahmed⁶

^{1*}Associate Professor of Medicine, Khairpur Medical college Khairpur mirs Pakistan. email: sufee1981@gmail.com (corresponding author)

²Consultant Physician/Medical officer, District Health Office Malir Karachi Pakistan. email: zahid.soomro56@gmail.com

³Assistant Professor of Community Medicine, Shaheed Mohtarma Benazir Bhutto Medical College Lyari Karachi Pakistan. email: memon.naeema2011@gmail.com

⁴ Associate Professor of Community Medicine, Khairpur Medical college Khairpur mirs Pakistan. email: drfarukh.bhanbhro@gmail.com

⁵Assistant Professor of Medicine, Isra University Hospital hyderabad Pakistan. email: Dr.gemini77@gmail.com

⁶Associate Professor Paediatrics, Pir Abdul Qadir Shah Jillani Institute of Medical Sciences Gambat Pakistan. email: drbabhanbhro1@gmail.com

***Corresponding Author:** Safdar Ali Pervez,

*Associate Professor of Medicine, Khairpur Medical college Khairpur mirs Pakistan. email: sufee1981@gmail.com

Abstract

Background: Between 11 and 21 million cases of typhoid fever are thought to occur worldwide each year, with 120,000 to 160,000 fatalities. There used to be a lower fatality rate, with roughly 16 million cases and 600,000 deaths. In 2007, it was reported that Pakistan, Peru, Indonesia, India, Egypt, Nepal, and Mexico were the world's main hotspots for typhoid fever. According to a 2003 examination, typhoid fever was the main cause of deaths in Pakistan each year. The ViPS and Ty21 vaccines were suggested by the World Health Organization (WHO) in 2008 as part of a Programme to stop typhoid outbreaks.

Objective: To determine the prevalence of typhoid fever among different socio demographic categories and genders.

Study design: A cross-sectional study

Place and Duration: This study was conducted in Khairpur Medical College Teaching Hospital, Khairpur Mir's from June 2023 to December 2023

Methodology: All suspected cases of typhoid fever, (male and female), regardless of age or socioeconomic status, were included in the study if they exhibited symptoms such as temperature over 99°F, relative bradycardia, abdominal pain, headache, diarrhea, weakness, etc. In addition to filling out a questionnaire, participants donated 5 milliliters of venous blood, which was centrifuged to produce serum. An Accu-Chek RAPID Diagnostic Test kit was used for the tests, and bands that appeared after 15 minutes were used to interpret the results.

Results: There were a total of 300 patients suspected of typhoid fever. There were a total of 199 cases (66.33%) that resulted in positive cases. Among the positive tests, there were 103 (51.7%) females and

96 (48.3) males. The number of people suspected of having symptomatic typhoid fever was significantly higher in the 21-30 years age range.

Conclusion: The study found that typhoid fever was more common among females, age group of 21 to 30 years, especially in rural and lower-class areas, than in urban and upper-class areas.

Keywords: Typhoid fever, prevalence, adults, socio demographics

Introduction

Between 11 and 21 million cases of typhoid fever are thought to occur worldwide each year, with 120,000 to 160,000 fatalities [1]. There used to be a lower fatality rate, with roughly 16 million cases and 600,000 deaths [2]. Southeast Asia accounts for over 93% of all cases worldwide, especially in areas with high population density and limited access to clean water, such as parts of South and Central America, India, and Africa [3, 4]. Typhoid bacteria are excreted in feces and are the main source of disease transmission, usually affecting youngsters [5].

In 2007, it was reported that Pakistan, Peru, Indonesia, India, Egypt, Nepal, and Mexico were the world's main hotspots for typhoid fever [6]. Typhoid fever is not common in developed nations like the United States and Canada [7]. But typhoid illness is common in Pakistan, a developing nation [8]. Compared to one-third of patients with enteric fever, children over the age of five have higher problems [9].

According to a 2003 examination, typhoid fever was the main cause of deaths in Pakistan each year [10]. According to a 2013 study conducted on pediatric patients in Quetta, 18.6% of them had serological evidence of typhoid fever [11]. In a 12-month period, 48% of females and 42% of males tested positive for both IgM and IgG antibodies overall, according to a different study done in Islamabad [12].

The ViPS and Ty21 vaccines were suggested by the World Health Organization (WHO) in 2008 as part of a vaccination programme to stop typhoid outbreaks [13]. The research sought to determine the prevalence of typhoid fever among different sociodemographic categories and genders in Pakistan, as there was no previous data available on the subject.

Methodology

Stratified random sampling was used to collect 300 blood samples from probable typhoid fever patients in different areas of Pakistan. Using an internet calculator, the sample size was calculated with a 50% population percentage, a 95% confidence level, and a 5.2% margin of error in mind.

All suspected cases of typhoid fever, (male and female), regardless of age or socioeconomic status, were included in the study if they exhibited symptoms such as temperature over 99°F, relative bradycardia, abdominal pain, headache, diarrhea, weakness, etc.

Exclusion criteria: The study did not include participants with multiple comorbidities such as diabetes mellitus, ischemic heart disease, and chronic renal disease, or those with life-threatening illnesses including cancer. Furthermore, patients who declined to participate were not included.

In addition to filling out a questionnaire, participants donated 5 milliliters of venous blood, which was centrifuged to produce serum. An Accu-Chek RAPID Diagnostic Test kit was used for the tests, and bands that appeared after 15 minutes were used to interpret the results.

In order to compare observed positive test frequencies with expected frequencies for each parameter, percentages and frequencies were employed, and IBM SPSS version 26 was utilized to perform a chi-squared test.

Results

There were a total of 300 patients suspected of typhoid fever. There were a total of 199 (66.33%) cases that resulted in positive cases. Among the positive tests, there were 103 (51.7%) females and 96 (48.3) males. The prevalence of typhoid fever did not vary significantly among age groups. Nonetheless, the number of people suspected of having symptomatic typhoid fever was significantly higher in the 21-

30 yearsage range, resulting in the largest number of positive cases among all age groups analyzed. Table number 1 shows the prevalence of typhoid fever among different age groups.

Table No. 1:prevalence of typhoid fever among different age groups.

Age groups (years)	No. of tests performed	percentage of positive tests
<1	30	6.70
1 - 10	35	9.62
11 - 20	38	14.23
21 - 30	70	28.45
31- 40	46	17.10
41 - 50	33	12.55
51 - 60	28	7.53
61 - 70	10	0.84
>70	10	2.09

Table number 2 shows the prevalence of typhoid fever according to socio-economic levels.

Table No. 2:prevalence of typhoid fever according to socio-economic levels.

Socio-economic level	No. of tests performed	Percentage of positive tests
Upper	81	16.31
Middle	102	37.66
Lower	117	46.02

Table number 3 shows prevalence of typhoid fever according to areas (urban or rural).

Table No. 3:prevalence of typhoid fever according to areas (urban or rural).

Area	Total no. of positive tests	Percentage of positive tests
Urban	199	40.5
Rural		59.4

Discussion

In South Asian countries like Pakistan, typhoid fever is considered the most contagious disease, causing high rates of illness and fatalities [14, 15, 16]. A significant number of cases are recorded nationally each year, especially in areas with poor food hygiene and limited access to safe drinking water [17]. Like other Asian nations, Pakistan experiences a high prevalence of typhoid fever due to a variety of socioeconomic variables [18, 19].

The incidence of typhoid fever did not significantly differ among the age groups examined in the study. Nonetheless, a higher proportion of positive cases was found among those between the ages of 11 and 50 years, suggesting a higher frequency in both working age groups and those who attend school or college. Notably, typhoid fever was more common in the age group of 21 to 30 years old, which is in line with research by Ghosh et al. [20]. This tendency may be caused by a number of variables, including the poor hygiene habits of young adults who frequently eat fast food. Males are more likely than females to contract typhoid fever, according to studies, probably as a result of their increased time spent outside the home.

In the summer, typhoid fever is more prevalent and is frequently transmitted via tainted food or water. According to this study, typhoid rates may be higher in people who eat homemade meals because of inadequate sanitation or contaminated water. Furthermore, people who relied on nearby water filtration facilities had the greatest positive test rates, followed by those who used tap water and mineral water in bottles.

Conclusion

The study found that typhoid fever was more common among females, age group of 21 to 30 years, especially in rural and lower-class areas, than in urban and upper-class areas.

Funding source

This research was conducted without receiving financial support from any external source.

Conflict in the interest

The authors had no conflict related to the interest in the execution of this study.

Permission

Prior to initiating this study, approval from the ethical committee was obtained to ensure adherence to ethical standards and guidelines.

References

1. Ishtiaq A, Khalil S, Khalil S, Ahmed F, Ahmad B, Ghaffar A, Khalid M, Azam SM, Imran M. Prevalence of Typhoid Fever among Different Socio-Demographic Groups in District Bahawalnagar, Pakistan: Prevalence of Typhoid Fever. *Pakistan Journal of Health Sciences*. 2023 Nov 30;138-43.
2. Tareen AM. Prevalence of Typhoid Fever in General Population of District Quetta, Balochistan, Pakistan. *Journal of Applied and Emerging Sciences*. 2016 Feb 26;5(2):pp70-73.
3. Rasul F, Sughra K, Mushtaq A, Zeeshan N, Mehmood S, Rashid U. Surveillance report on typhoid fever epidemiology and risk factor assessment in district Gujrat, Punjab, Pakistan. *Biomedical Research*. 2017 Jan 1;28(8):1-6.
4. Hussain A, Ahmad T, Khan M, Rahim F, Chinenyenwa O, Jadoon MA. Occurrence of typhoid among the local population of district Dir Lower: A laboratory based study. *Polish Annals of Medicine*. 2019 Jul 1;26(2).
5. Mehboob F, Arshad A, Firdous S, Ahmed S, Rehman S. Estimated percentage of typhoid fever in adult Pakistani population (TAP) study. *Annals of King Edward Medical University*. 2013;19(1):18-.
6. Essa F, Hussain SZ, Batoool D, Usman A, Khalid U, Yaqoob U, Shahzad H. Study of socio-demographic factors affecting the prevalence of typhoid. morbidity and mortality. 2019 May;1(2):9. Medhat AR, Aljanabay AA. Epidemiology of typhoid fever in Balad City, Iraq. *International Journal of Health Sciences*. 2022;6(S1):1049-63.
7. Shah GJ, Poudel TP. A Study of Typhoid Fever in Bheri Zonal Hospital and Nepalgunj Medical College Teaching Hospital, Banke, Nepal. *Journal of Health and Allied Sciences*. 2013;3(1):31-4.

8. Kalsoom K, Fazal Akbar FA, Muhammad Younas MY, UMBER Tasneem UT, Muhammad Suleman MS, Ali SS, Shahid Ali SA, AnilaRoohi AR. Prevalence of typhoid fever in five Southern districts of Khyber Pakhtunkhwa, Pakistan: a preliminary study.
9. Chandra H, Singh B, Srivastava J, Prasad R, Nautiyal AR. Seroprevalence of typhoid in Dehradun valley (Uttarakhand), India. *Research in Environment and Life Science*. 2010;3(2):65-8.
10. Medhat AR, Aljanabay AA. Epidemiology of typhoid fever in Balad City, Iraq. *International Journal of Health Sciences*. 2022;6(S1):1049-63.
11. Shah SM, Yousafzai M, Lakhani NB, Chotani RA, Nowshad G. Prevalence and correlates of diarrhea. *The Indian Journal of Pediatrics*. 2003 Mar; 70(3): 207-211. doi: 10.1007/BF02725583.
12. Malik A and Malik R. Typhoid fever in Malaysian children. *The Medical Journal of Malaysia*. 2001 Dec; 56(4): 478-490
13. Crump JA, Luby SP, Mintz ED. The global burden of typhoid fever. *Bulletin of The World Health Organization*. 2004 May;82(5):346-53.
14. Mogasale V, Maskery B, Ochiai RL, Lee JS, Mogasale VV, Ramani E, et al., Burden of typhoid fever in lowincome and middle-income countries: a systematic, literature-based update with risk-factor adjustment. *The Lancet Global Health*. 2014 Oct; 2(10): 570-80. doi: 10.1016/S2214-109X(14)70301-8
15. Radhakrishnan A, Als D, Mintz ED, Crump JA, Stanaway J, Breiman RF, et al., Introductory article on global burden and epidemiology of typhoid fever. *The American Journal of Tropical Medicine and Hygiene*. 2018 Sep; 99(3): 4-9. doi: 10.4269/ajtmh.18- 0032.
16. Date KA, Newton AE, Medalla F, Blackstock A, Richardson L, McCullough A, et al., Changing patterns in enteric fever incidence and increasing antibiotic resistance of enteric fever isolates in the United States, 2008–2012. *Reviews of Infectious Diseases*. 2016 Apr; 63(3): 322-329. doi: 10.1093/cid/ciw232
17. Buckle GC, Walker CLF, Black RE. Typhoid fever and paratyphoid fever: systematic review to estimate global morbidity and mortality for 2010. *Journal of Global Health*. 2012 Jun; 2(1). doi: 10.7189/jogh.01.010 401.
18. Sulaiman K and Sarwari A. Culture-confirmed typhoid fever and pregnancy. *International Journal of Infectious Diseases*. 2007 Jul; 11(4): 337-341. doi: 10.1016/j.id.2006.09.007.
19. Hornick R, Greisman S, Woodward T, DuPont H, Hawkins A, Snyder M. Typhoid fever: pathogenesis and immunologic control. *New England Journal of Medicine*. 1970 Oct; 283(14): 739-746. doi: 10.1056/NEJM197010012831406
20. Ghosh S, Batabyal P, Rajendran K, Palit A. Typhoid Fever in Rural Communities of West Bengal, India—an Age-Wise Perspective. *Japanese Journal of Infectious Diseases*. 2010 May; 63(3): 219-221. doi: 10.7883/yoken.63.219