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A Study On the Prevelance of Typhoid Fever, Associated with Comorbidities and Management Challenges in Sialkot, Pakistan

Fatima Afzal[1], Sherjeel Adnan[2], Mahrukh Tariq[3], Aneesa AbdulAziz[4], Esha Ashfaq[5], Saim Asmat[6], Mubashir Ali[7]

[1,2] Faculty of Pharmacy, Grand Asian University, Sialkot, Pakistan.
[3,4,5,6,7] Islam College of Pharmacy, Pakistan.

*Corresponding author: **Fatima Afzal**, Institute of Pharmacy, Grand Asian University, Sialkot Pakistan, Email: fatima.afzal@gaus.edu.pk

Abstract

Typhoid fever is a bacterial infection mostly caused by contaminated food and water. It can affect people of any age but most probably the elderly or people living in poor sanitation. Despite it is very common disease occurring in Pakistan many people are unaware of the cause of the disease and they lack information about how to overcome it. The goal of this study is to assess the knowledge and awareness of typhoid fever among general population of district Sialkot, Punjab, Pakistan

Methods: A cross-sectional survey was conducted with 399 individuals from Sialkot's general population. The designed Questionnaire was distributed, dully filled by participants after getting their consent

Results: Out of 399 individuals 85% people are aware of the term typhoid fever remaining 15% are unaware. Certain factors affect awareness levels of typhoid fever among people such as age, education level and gender. 54.1% people consider this disease life threatening 70% people are aware about the diagnostic procedures.

Conclusion: The conclusion of the study is that most of the people of district Sialkot are aware about the disease typhoid fever. Mostly people are aware of the diagnostic procedures and treatment protocols

Keywords: Typhoid Fever, Sialkot, Awareness, Knowledge, Symptoms, Risk Factors**.**

Introduction

Typhoid fever is a serious health problem in low-income areas mostly in developing countries (Saleem & Hasali., 2019). It is caused by Salmonella typhimurium bacteria which lives in hot, humid, and unhygienic environments. People become infected through contaminated water and sewage systems, or by consuming contaminated food and drinks (Kabwama et al., 2017). Lack of clean water and proper sanitation in these areas contributesto the spread of the disease. People i8suffering from typhoid feverface serious health consequences, including morbidity and mortality (Bulage et al., 2017). Unfortunately, the issue is often neglected by local governments due to lack of resources and awareness. Many low- income areas do not have access to proper sanitation or clean drinking water, leading to the mixing of sewage water with household water. Improving hygiene and sanitation in these communities is crucial to prevent

the spread of typhoid fever. It is important to educate individuals in low- income areas about the link between hygiene, health, and quality of life (Patrick et al., 2021 & Rizvi et al., 2014). Gujranwala is a city in Pakistan that has a large population that works in agriculture and small homebased industries. Due to low education levels and cultural practices, many people in this area lack proper sanitation facilities that leads to health risk (Mushtaq et al., 2011). Providing private toilets is essential for controlling diseases spread through fecal-oral contact. The city has a significant population with a high proportion of women living in rural areas. Typhoid fever is a common issue in Gujranwala, with a substantial number of cases reported each year. Many efforts have made to control the disease but challenges occurs including limited resources and lack of access to proper healthcare. It is crucial to invest in education, clean water, and environment to prevent the spread of typhoid fever (Barac et al., 2018). Women in Pakistan often face barriers in accessing healthcare that shows the need for better support and interventions. Worldwide, there are about 12 to 27 million cases of typhoid fever (TF) each year (Chatham-Stephens et al., 2019). Annually Typhoid Fever leads to approximately 128,000 to 161,000 deaths (Date et al., 2014). In Asia alone, around 216,500 people die from Typhoid Fever each year (Date et al., 2014). Another factor contributing to the spread of Typhoid Fever is that some patients travel internationally without proper medication or vaccination (Anwar et al., 2014). Although monitoring and treatment for typhoid are available, research does not adequately address the cultural beliefs and practices that increase the risk of infection in vulnerable groups (Mushtaq et al., 2011)

Materials and Methods

Study Design

A descriptive cross-sectional study design (Appendix A) was used to conduct this study using a structured and validate questionnaire assessing the demographic characteristics, level of knowledge, and awareness towards Typhoid Fever. This cross-sectional study design was adopted to point out specific problem at a specific time. This study design does not require any follow-up, making it cost-effective, simple to carry and providing quick findings.

Study Setting

The cross-sectional study was conducted to study prevalence of Typhoid Fever, Associated with comorbidities and management challenges among general population of Sialkot, Punjab, Pakistan. Sialkot district spreads over an area of 3016 km ^{2}. The current metro area population of Sialkot in 2024 is 771,000. In this study data was collected among general population of Sialkot district including urban and rural areas.

Targeted Study Population

To study prevalence of Typhoid Fever, associated with comorbidities and management challenges among general population of Sialkot, Punjab, Pakistan were targeted for current study purpose.

Sample Size

To study prevalence of Typhoid Fever, associated with comorbidities and management challenges among general population of Sialkot, Punjab, Pakistan during study period (May to Oct) who were fulfilling the inclusion criteria were included in this current study. The sample size was calculated on the basis of population size (N) of Punjab with 95% of confidence of interval (CI) AND 5% of margin of error (E). Rao soft online sample size calculator was utilized for sample size calculation by using (Raosoft 2020). A sample size of 399 was calculated by the formula. Larger the sample size the more statistically significant it is.

Sampling Procedure

Convenience sampling method is a nonprobability method of sampling in which the researcher uses sampling that does not provide for each member of targeted population to participate in current study.

Inclusion Criteria

- Both male and female were included in the study
- Participant who was willing to participate in current study.
- Patients who were mentally fit and able to respond to the study question.

Exclusion Criteria

- People who were not willing to participate.
- Participants who were mentally unfit and unable to respond.

Data collection tool

To study prevalence of Typhoid Fever, Associated with comorbidities and management challenges among general population of Sialkot, Punjab, Pakistan. After comprehensive literature review, a structured questionnaire was developed to collect fact on demographic characteristics (age, education, marital status and location), people knowledge and awareness about Typhoid Fever Section 1 contained demographic data. Section 2 was compromised of items for assessing knowledge, and further sections consists of assessment and knowledge of risk factors, sign and symptoms, diagnosis and treatment and Section 6 was compromised of assessment and awareness only in affected patients.

Data collection method

A face-to-face interview of respondents was conducted among general population of Sialkot. In order to obtain authentic and validated information from the respondents.

Assessment of validity and reliability of Data Collection Tool

A group of specialties examined the questionnaire for face and content validity.

Data Analysis

For the analysis of our study results SPSS version 27 (2024) and Microsoft excel (2024) is used. Statistics (frequency, cumulative frequency, and percentage) are calculated A supervisor reviewed the questionnaire also.

Results

Demographic Variables of Respondents

The findings from this study provide us a data for assessment of knowledge and awareness of Typhoid Fever among general population of District Sialkot Punjab, Pakistan. The data of our research reveals about knowledge, awareness, signs and symptoms as well as treatment and its risk factors of typhoid fever. Our study was conducted on 399 number of people with the following demographic level (age in years) 0 to 15 (3.76%), 16 to 25 (87.72%), 26 to 34 (4.51%), 36 to 45 (4.01%), and above 45 (0%). Out of 399, unmarried were (81.95%), married (12.78%), divorced (2.25%), widowed (3.01%.

Table 3.1 Respondent's Socio-demographic variable response

Sr.no	Questions	Options	Frequency (n=399)	Percentage (%)
1.	Age	0-15	15	3.76
		16-25	350	87.72
		26-35	18	4.51
		36-45	16	4.01
		Above 45	0	0
2.	Marital Status	Single	327	81.95
		Married	51	12.78
		Divorced	9	2.25
		Widowed	12	3.01
3.	Qualification	Uneducated	12	3.01
		Primary	3	0.75
		Middle	9	2.25
		Secondary	18	4.51
		Higher Secondary	324	81.2
		PHD	6	1.50
		M.Phil.	27	6.76
4.	Location	Urban	141	35.33
		Rural	258	64.66

Participants General Knowledge about Typhoid Fever

People that have prior information about typhoid fever were (85.71%) and (14.28%) did not have prior information about the diseases. The sources of information about disease among people were as; health care professionals (24.81%), newspaper /magazines (6.01%), internet/TV (30.07%) and family and friends/family (8.27%) A significant majority (81.8%) had prior information, primarily from healthcare professionals (26.5%) and friends/family (8.27%). The people those who were saw typhoid fever patient in their surroundings were (66.92%)

Participants' Knowledge of Typhoid Fever-Related Risk Factors

The ratio of the reasons of disease were contaminated water/ food (42.11%), raw vegetables/fruits (0%), poor personal hygiene (6.76%), and all of the above (51.12%). The risk factors of disease can be avoided by life style modification as; rest (14.28%), get vaccinated (35.34%), knowing about risk factors of disease (45.11%), avoid close contact (5.26%). People (78.95%) were aware about disease risk factors and (21.05%) did not have any awareness about disease risk factor. The ratio of risk factors of disease were as; poor hygiene habit (10.53%), poor sanitation conditions (6.02%), excessive use of antibiotics(3.01%), contaminated water (27.82%), raw vegetables/ fruits (3.01%) and all risk factors (49.62). The risk factor that cause disease according to people were poor **sanitation conditions (12.78%), contaminated water** (58.65%), poor hygiene habits (22.55%), excessive use of antibiotics (2.25%) and raw vegetable/fruits (3.75%). Patients who are on medications were (36.09%) and (68.91%) did not as shown in figure 4.13. The patients that were on medication; used chloramphenicol (9.02%), ciprofloxacin (46.62%), azithromycin (26.32%) and (33.08%) did not see any case in their surroundings. The people who have seen patient of (62.4%), friends (22.55%), in hospitals (7.52%) and at workplace (7.52%). (24.4%).(18.04%) used all of the above three antibiotics as shown in figure 4.14. The age group (in years) that were suffer from typhoid fever 0 to15 (24.06%), 16 to 26 (33.83%), 26 to 35 (15.78%), 36 to 45 (14.28%) and above 45 (14.28%). Patients who were aware about signs and symptoms of typhoid fever (87.24 %) were aware and (12.78 %) were unaware as shown in figure 4.16. The ratio of signs and symptoms of typhoid fever according to patients were as; high body temperature (37.59%), fatigue (5.26%), nausea/vomiting (4.51%), diarrhea (3.01%), intestinal ulcer (3.01%), and (46.62%) were said all the above signs and symptoms as shown in figure 4.17, A study of Buckulwood, Friedrick J. (1984). Also reveals 93% of the total population of survey have high fever, 15% have headache and tiredness. The public (70.67%) have known about the diagnostic procedures and (5.24%) did not know. The diagnostics tests for typhoid fever that are suggested by the physician to patients were CBC test (42.11%), Widal blood test (48.87%), urinalysis (2.25%) and stool analysis (3.76%) as shown in figure 4.20. The ratio of about most accurate diagnostic test(63.16%) people were know about it and (36.84%) did not as shown in figure 4.21. The information about medicines that are used in typhoid fever (63.16%) people know it and (36.84%) did not know which medicines are used as shown in figure 4.22. The ratio of people who were aware about the most effective treatment (59.39%) and (40.6%) did not know as shown in figure 4.23. Out of these ciprofloxacin (67.67%) is the most effective medicine, chloramphenicol (9.77%), ampicillin (18.05%) and co trimoxazole (4.51%) were effective.

Table 3.2 Participants General Knowledge about Typhoid Fever

Sr.no	Questions	Options	Frequency (n=422)	Percentage (%)
1.	**Do you have prior information about Typhoid Fever**	Yes	342	85.71
		No	57	14.28
2.	**If yes what is the source of information?**	Health-care professionals	99	24.81
		Books/Newspaper	24	6.01
		Friends/Family	156	39.09
		Internet/TV	120	30.07
3.	**Have you seen any case of Typhoid Fever in your surroundings?**	Yes	267	66.92
		No	132	33.08
4.	**If yes, where have you seen?**	Family	249	62,41
		Friend	90	22.55
		Institute	30	7.52
		Workplace	30	7.52
5.	**Is Typhoid Fever a life threatening condition?**	Yes	216	54.14
		No	183	42.11

Table 3.3 Participants' Knowledge of Typhoid Fever Related Risk Factors.

Sr No.	Questions	Options	Frequency (n=399)	Percentag e %
1.	**Do you know about risk factors of Typhoid Fever**	**Yes**	315	78.95
		No	84	21.05
2.	**If yes, which of the following can be the risk factors?**	Poor hygiene habits	42	10.53
		Poor sanitation Condition	24	6.02
		Excessive use of Antibiotics	12	3.01
		Contaminated water	111	27.82
		Raw vegetables/ Fruits	12	3.01
		All of the Above	198	49.62
3.	**Are you on a medication?**	Yes	131	31.0
		No	291	69.0
4.	**Which of the following medications are you taking?**	Azithromycin	105	26.32
		Chloramphenicol	36	9.02
		Ciprofloxacin	186	46.62
		All of the above	72	18.04
5.	**Which age group is at high risk of Typhoid Fever**	0-15	96	24.06
		16-25	135	33.83
		26-35	63	15.78
		36-45	57	14.28
		Above 45	48	12.03

Participants' Knowledge Related Complications of Typhoid Fever

The symptoms that patients faced during typhoid fever; high body temperature (32.33%), headache (2.25%), diarrhea (3.01%), muscle ache (6.02%), weight loss (6.02%), all of the symptoms (50.37%) as shown in figure 4.24. The time duration of the symptoms that the patients were faced are category as; less than one week (16.54%), one to two weeks (43.61%), two to four weeks (18.79%), and more than four weeks (21.05%) as shown in figure 4.25.When patients suffered from typhoid fever; patient (74.44%) went to consult the disease with a doctor, (10.53%) used home remedies, (9.77%) discuss the disease with their family members and friends, while (5.26%) take rest to treat the disease.

Table 3.4 Participants' Knowledge Related Complication of Typhoid Fever

Sr no	Questions	Options	Frequency (n=399)	Percentage %
1	Do you know about signs and symptoms of Typhoid Fever?	Yes	348	87.22
		No	51	12.78
2	If Yes, which of the following you consider as a sign and symptom of Typhoid Fever?	Fever	150	37.59
		Fatigue	21	5.26
		Nausea/Vomiting	18	4.51
		Diarrhea	12	3.01
		Intestinal Ulcer	12	3.01
		All of the above	186	46.62
3	Do you know which type of symptoms?	Fatigue	78	19.55
		Loss of apetite	60	15.04
		Fever	240	60.15
		Stomachache	21	5.26

Participants Knowledge Related

To diagnose typhoid fever the physician recommend the patients the following tests; CBC test (48.87%), Widal test (32.33%), urine test (12.78%), and stool analysis test (6.02%). In the treatment of typhoid fever physician prescribe the patients antibiotics (65.41%), pain management (6.07%), fluid replacement (12.03%), dietary modification (7.52%) as well as therapy (8.27%). A study of Zulfiqar Ali Bhutta. (2006). Also reveals doctor prescribe 70% antibiotics to typhoid fever patient and 10% pain medications are given to them.

Table 3.5 Participants Knowledge Related Diagnosis

Sr No	Questions	Options	Frequency (n=399)	Percentage %
1.	Do you know about the diagnostic procedures of Typhoid Fever?	Yes	282	70.67
		No	117	29.32

2.	If Yes, Which of the following options do you know?	CBC	168	42.11
		Urinalysis	9	2.25
		Widal Test	195	48.87
		Stool Analysis	27	6.76

Participants Knowledge Related Medical Treatment

The ratio of life modification that were followed by the patients after treatment described as; exercise (30.53%), healthy diet (18.79%), knowing more about risk factors (13.53%),avoid toxins (8.27%) and all of the above (51.87%). The stage of improvement that the patient feel after getting treatment and adopting life style modifications as; little improvement (12.03%), getting better day by day (52.63%), fully recovered (21.8%)and with no improvement (13.53%).

Table 3.6 Participants Knowledge Related Medical Treatment

Sr No	Questions	Options	Frequency (n=399)	Percetage%
1.	**Do You know about Treatment options for Typhoid Fever?**	Yes	237	59.39
		No	162	40.01
2.	**If yes, Which of the following options do you know?**	Ciprofloxacin	270	67.67
		Chloramphenicol	39	9.77
		Ampicillin	72	18.05
		Co-trimexazole	18	4.51

Conclusion

The conclusion of our study is that typhoid fever is an infectious disease and its causes most of the cases are contaminated water and food. Most of the people of Sialkot district know about the causes that is unhygiene environment, signs and symptoms of typhoid fever that are high fever and tiredness. The risk factors are poor sanitation, contaminated water, raw vegetables/fruits and unhygienic environment. Ciprofloxacin is the most commonly used antibiotic that is used to treat typhoid fever while other antibiotics like ampicillin, chloramphenicol and co- trimoxazole are also used. The common signs and symptoms of typhoid fever are high body temperature (fever), nausea, vomiting, diarrhea and in severe condition intestinal ulcer. For diagnosis of the typhoid fever physician prefer blood culture test while other tests like Widal test, stool analysis and urine examination tests are also performed. People mostly used antibiotics in typhoid fever that will induce antibiotic resistance in them. The severity of typhoid fever will be reduced by adopting these preventive measures like used only filtered or boiled water for drinking purpose, avoid junk foods and especially wash your hands before eating anything.

Recommendations

Develop educational campaigns focusing on Typhoid Fever, targeting at-risk groups, particularly in rural areas. Establish regular screening for Fever, especially for high-risk groups such as those with diabetes and hypertension. Encourage policies that promote early diagnosis and provide affordable access to Typhoid Fever treatments and diagnostic facilities. Involve local healthcare providers in community outreach programs to disseminate accurate information about general health. Additional studies can expand on this research to explore awareness across other regions, aiding in the creation of a comprehensive national typhoid fever strategy.

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