

Prevalence of Typhoid Fever in General Population of District Quetta, Balochistan, Pakistan

Abdul Malik Tareen¹, Muhammad Qasim², Yasmeen Akhtar¹, Sarwar Pirkani³, Ashok Kumar⁴, Kalimullah Khan², Mohammad Alam Mengal⁵, Hazir Rahman²

¹Department of Microbiology, University of Balochistan, Quetta, ²Department of Microbiology, Kohat University of Science and Technology, Kohat, ³Department of Microbiology, Bolan Medical College and Hospital, Quetta, ⁴Medical Research Centre, Liaquat University of Medical & Health Sciences Jamashoro, ⁵Centre for Advanced Studies in Vaccinology & Biotechnology, University of Balochistan, Quetta, Pakistan.

Abstract

Typhoid fever is a systemic illness, caused by ingestion of contaminated food and water with Salmonella typhi and paratyphi. It is one of the serious problems worldwide, especially in developing countries. In the presented study determined the prevalence of typhoid fever in general population of district Quetta, Balochistan, Pakistan. The study was carried out from January 2011 to April 2011 at microbiological laboratory of BMCH (Bolan Medical College Hospital) Quetta. A total of 1326 patients, having the symptoms of fever, abdominal pain, vomiting, diarrhea and loss of appetite were included in the study. Venous blood samples were collected aseptically and subjected to specific sero-diagnostic technique (Widal's test) using standard procedure. Out of 1326 typhoid suspects, 194 (14.63%) samples were positive for typhoid. Individuals of age group (11-20 years) being more affected (23.98%), while others with age group (51-60 years) were least affected (3.2%). Out of 194 positive samples, male population was more affected (15.86%). Furthermore, typhoid fever was more prevalent (15.30%) in Quetta rural area as compared to Quetta urban (13.45%). It is concluded that typhoid fever can occur at any age group but school and college going ages were more affected. In addition, male patients and patients from rural area showed increase risk of getting infection.

Key words: Typhoid fever, Quetta, Prevalence

Corresponding author's email: alammengal@yahoo.com

INTRODUCTION

Typhoid fever is a bacterial disease caused by bacterium Salmonella Typhi. The symptoms of typhoid fever may include high grade fever and constipation followed by diarrhoea, loss of appetite and rose spots. This disease is contacted through contaminated food and water. It is estimated that 2.16 million episodes of typhoid occurred worldwide. Consequential in 216 000 deaths, and that more than 90% of this morbidity and mortality occurred in Asia (WHO, 2010). Typhoid fever is the sixth most common cause of death in Pakistan and its prevalence in our country is estimated to be 412 cases per 100,000 population per year (Hayat et al., 2010 ; Ghosh et al., 2010). Enteric fever is prevalent all over the world, but it is more frequently seen in developing

countries of South East Asia, Africa and some parts of Latin America. In 2000, it was estimated that typhoid afflicted around 21 million people throughout the world and caused around 0.21 million deaths (Crump et al., 2004).

It is reported that 33 million new cases are diagnosed for typhoid annually worldwide, out of which 13 million appear in Asia, South and Central American and African regions. The main reason for the high incidence of the disease is the high population growth rate in these regions, which subsequently leads to rapid urbanization which in turn creates a burden on the natural resources such as water and also the infrastructure and health services (Pang et al., 1995; Wilke et al., 2002).

Currently epidemiological studies showed that the subjects 100/1000,000 per year in South-East and Central Asian regions have the highest endemic rates (Yung et al., 2004; Moehario et al., 2009). In Pakistan the incidence of typhoid fever is 412 cases per 100,000 populations (WHO, 2008). Therefore, it is less common in developed countries due to improved sanitation, hygienic conditions and vaccination and also they helped to control and prevent typhoid fever in areas where it is now curtailed to local epidemics (Mermin et al., 1998). However, in developing countries like Pakistan, it is still continued to bear the burden of disease due to low standard parameter sets for drinking water supply, hygiene and sanitation (Sinha et al., 1999; Brooks, 2005). Diagnosis of typhoid fever in the laboratories relies mainly on the isolation of the salmonella enterica sub sp. *enterica* serotype *Typhi*.

The present study was carried out to determine the prevalence of Typhoid fever by selected samples from different regions of district Quetta, Balochistan, Pakistan.

MATERIALS AND METHODS

The present study was conducted in Bolan Medical Complex Hospital (BMCH), Quetta, Balochistan, Pakistan from January 2011 to April 2011. A cross sectional study was designed, selected a total of 1326 subjects with the age of 1 year up to 70 years from both gender male and female, presenting with fever $\geq 38^{\circ}\text{C}$ for about two weeks and at least one of the signs, such as, nausea, vomiting, abdominal pain, headache. The demographic information was obtained including month, area (rural and urban), gender and age.

Five (5) ml of blood sample was collected with disposable sterile syringe from each subject via aseptic veni-puncture and were transferred in test tube with out anticoagulant. The blood sample was centrifuged at 3500 rpm and the serum was separated for Widal test.

For serodiagnosis of typhoid fever, the Widal agglutination test was performed according to manufacturer's guideline. This test determines the agglutinins (antibodies) in the serum of a patient against Salmonella

antigens H (flagellar) and O (somatic) (Bakr et al., 2011). Fifty microliter of serum sample was mixed with one drop (50 microliters) of the Widal suspension (anti O and anti H) on a glass slide by stirring for a few seconds. After clumping, within one minute was considered as positive test. A high titre of $>1:160$ against O antigen was considered significant for the diagnosis of typhoid fever. The demographic data was collected on performa and analyzed by using SPSS-16.

RESULTS

Out of total 1326 patients typhoid fever suspects of district Quetta, 14.63% (n=194) patients were revealed serologically positive for typhoid fever. Prevalence of typhoid fever positive patients was checked according to months, age, gender and area.

The onset of typhoid fever was found high (17.67%, n=76) in April among 430 suspected subjects (Table 1).

Table 1: Prevalence of typhoid fever, according to months

Serial No.	Month	Suspected Subjects	Positive	Percent positivity
1	January	221	31	14.02
2	February	283	38	13.42
3	March	392	49	12.50
4	April	430	76	17.67
Total		1326	194	14.63

Table 2: Prevalence of typhoid fever according to age group

Serial No.	Age group	Suspected Subjects	Positive	Percent positivity
1	1 – 10	294	16	5.4
2	11 – 20	346	83	24.0
3	21 – 30	334	59	17.7
4	31 – 40	124	28	22.6
5	41 – 50	85	3	3.5
6	51 – 60	62	2	3.2
7	61 – 70	81	3	3.7
Total		1326	194	14.6

Prevalence of Typhoid fever was observed significantly higher 24.0% in 11-20 years age group among 346 suspects, followed by 31-40 of age and 21-30 (22.6% and 17.7%) respectively (table 2).

The prevalence of typhoid fever was found significantly high (15.86%, n=141) in males among 889 male suspected patients as compared to female patients (Table 3).

Table 3: Prevalence of typhoid fever according to gender

Serial No.	Gender	Suspected Subjects	Positive	Percent positivity
1	Male	889	141	15.86
2	Female	437	46	12.12
Total		1326	194	14.63

There was no significance observed between areas but higher prevalence of typhoid fever was found in rural area 15.30 % (n=129) as compared to the urban area (Table 4).

Table 4: Occurrence of typhoid fever according to area

Serial No.	Area	Suspected Subjects	Positive	Percent positivity
1	QTA (R)	843	129	15.30
2	QTA (U)	483	65	13.45
Total		1326	194	14.63

DISCUSSION

Enteric fever continues to be endemic in poor countries, including Pakistan, where it represents one of the leading causes of morbidity and mortality in the country. In the present study, the prevalence of Typhoid fever was studied in rural and urban area of Quetta district. Overall prevalence of typhoid fever was found 14.63% in span of four months from January to April 2012 (table. 1). However, it is also investigated on the basis of age, gender, and area. Typhoid

fever was found in patients during all four months but it is observed that the prevalence rate was higher in the month of April 76 (17.67%). The present study results are corroborated with the results reported that the prevalence rate of typhoid fever is higher during summer in Indonesia and Pakistan (Siddiqui et al., 2006). Similarly it is reported that this disease occurs sporadically all over the year, but with a peak incidence during summer (Hatta et al., 2009). The prevalence rate of typhoid fever was observed in different age groups from 1-70 years of age (table.2), although the highest prevalence rate was found in 11-20 years (23.98%) of age group, while lowest rate was observed (3.2%) in 51-60 years of age group. The prevalence of typhoid fever was significantly higher in adolescent and college age, may be due to eating and drinking of unhygienic food and water. The present study findings are slight difference when comparing with the results reported by (Ayaz et al., 2006) that the prevalence of typhoid fever was less than 15 years of age group (Ayaz et al., 2006). However, there was no similarity observed when the results were compared with the results reported by (Prajapati et al., 2008) they were found typhoid fever in 1-10 years of age group that may be due to some factors such as environmental, behavioral patterns and immunological status of the subjects of their study.

Current study showed that prevalence rate of typhoid fever was significantly higher in male (15.86%) subjects than female (12.12%) subjects (Table 3). Predominance of typhoid fever in male subjects may be due to their more outdoor activities, which increase their risk to consume unhygienic and contaminated food. Low prevalence in female subjects may be due to the fact that they remain indoor and are keen to follow basic hygienic principles. The results were corroborated with the previous findings of (Prajapati et al., 2008).

The prevalence of typhoid fever was found high (15.30%) in rural area as compared to urban area (13.45%) (Table.4). The main factors, contributing to high prevalence of typhoid fever in rural areas that includes low living standards, poor or even absence of sanitation, over crowdedness, lack of access

to clean drinking water, consumption of unhygienic food, and lack of medical facilities for proper diagnosis and treatment.

The present study recommended that the government should provide hygienic food and water, health care facilities to the people living in poor hygienic areas. Awareness programs regarding the control of typhoid fever should be initiated, which must include education about up raising personal hygienic measures. The above mentioned measures will reduce the risk of typhoid fever to a great extent.

In conclusion, the present study determined that typhoid fever is endemic in the region of district Quetta and significantly higher in young school going, college going age groups and male subjects. In addition economically unsustainable poor people of rural area are at high risk to attaining typhoid fever.

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