

## Prevalence of Tuberculosis Infection in General Population of District Dir (Lower) Pakistan

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**Abstract:** Tuberculosis (TB) is a chronic bacterial disease, caused by *Mycobacterium tuberculosis*. Among infectious diseases on the surface of the globe millions of deaths occur annually due to TB, especially in the low income countries. Aim of the current research was to investigate the rate of infection of TB and aware the peoples about the TB infection in District Dir (Lower) Khyber Pakhtunkhwa, Pakistan. A retrospective study was carried out during 1<sup>st</sup> January 2013 to 31<sup>st</sup> December 2013. The sputum smear microscopy was done of all suspected cases. Of the total 1378 suspected cases, 612 (44.41%) were positive for TB. Female are more susceptible victims to get TB infection as compared to male population 56.21 and 43.79% respectively. Highest rate of 23.54% of new pulmonary TB cases was observed in age 15-24 years, while highest 47.26% of cases were recorded in quarter 4. From our finding it was concluded that TB was significantly increased in general population of District Dir (Lower). Proper management, treatment, diagnosis and awareness are needed to control and eliminate the disease.

**Key words:** Tuberculosis • Chronic • *Mycobacterium tuberculosis* • Retrospective Study • Sputum Smear Microscopy

### INTRODUCTION

Tuberculosis (TB) is a contagious and airborne bacterial disease caused by *Mycobacterium tuberculosis*. TB is a serious problem for the human beings Worldwide. TB mostly affects the young age groups and their productive time period and 95% of TB death occurs in developing countries. Among infectious diseases the TB ranked second leading cause of death worldwide after HIV. Each year millions of peoples are infected with TB [1].

In 2012, 8.6 million new cases of TB were reported along with 1.3 million death occurred due to TB. Of the total reported cases of TB in 2012, there were an approximately 2.9 million cases occurred in women and 410,000 death were reported. The estimated 530,000 cases were recorded in children among 74000 deaths [1].

In 2010, a total of 320,000 women died from TB. For the treatment, prevention and elimination, the Directly Observed Treatment short-course (DOTS) was launched by World Health Organization (WHO) in 1994. In 2010, 5.7 million cases of TB were notified through DOTS

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programme. 87% peoples were successfully treated in 2009. In 2010, approximately 650,000 cases of multidrug-resistant TB (MDR-TB) were recorded. In 2008, an estimated 150,000 MDR-TB deaths were occurred annually [2].

9.8 million incident cases were reported in 2010 (128 cases per 100 000 population) along with 1.1 million HIV positive cases. In 2010, the high No. of incident cases were reported from India (2.0-2.5 million cases) followed by China (0.9-1.2 million cases), South Africa (0.40-0.59 million cases), Indonesia (0.37-0.54 million cases) and 0.33-0.48 million cases from Pakistan [3].

India and China contribute 38% of all cases (26% from India and 12% from China). South Africa and Swaziland had the highest incidence of TB and 1 new case occurs each year per 100 people [1]. In Asia, 59% cases of TB were reported in 2010, while from Africa 26%, Eastern Mediterranean 7%, Europe 5% and Americas 3% [3]. In 2012, 58% cases of TB were reported from Asia, African Region 27%, Eastern Mediterranean 8%, Europe 4% and Americas 3% [1].

This study aimed to determine the rate of infection of TB among the local population of District Dir (Lower) Khyber Pakhtunkhwa, Pakistan.

### MATERIALS AND METHODS

A total of 1378 suspected patients were studied from 1<sup>st</sup> January 2013 to 30<sup>th</sup> December 2013. A retrospective study was designed. The sputum smear microscopy was done using Ziehl-Nelson staining method. The result with positive smear was declared positive for TB while negative smear declared negative for TB. The demographic information of the patients were collected including age, gender, types of TB and previous history.

According to previous treatment, results of smear and severity of disease the patients were classified into New (N), Relapses (R), Treatment after failure (F), Treatment after default (D) and Others (O). New case (N): The patients who have been never diagnosed for TB infection. Relapses (R): Patients who completed the TB treatment and declared cured from TB and found smear positive for TB. Treatment after failure (F): A patient who gave positive smear at the end of five month or more of treatment. Treatment after default (D): The patients who were previously declared default from treatment and found smear positive. Others (O): Those patients who didn't fill the above category were placed in others cases. For age wise analysis the local population was divided in to six age groups including 0-14 years, 15-24 years, 25-34 years, 35-44 years, 45-54 years and >55 years. For descriptive analysis of the data Micro Soft Excel 2007 were used.

### RESULTS

The ethical authority of District Head Quarter Hospital District Dir (Lower) approved the current study. From 1<sup>st</sup> January 2013 to 31<sup>th</sup> December 2013 a total of 1378 cases was studied. Of the total cases 612 (44.41%) were positive for TB infection with a ratio 268(43.79%) males and 344(56.21%) females (Table 1). The occurrence of TB was high in females as compared to males' population of District Dir (Lower).

The quarter wise distribution of TB patients was analyzed. The results showed that the highest rate of TB infection 47.26% was recorded in quarter 4 followed by 44.68% in quarter 1, 43.37% in quarter 3 and 42.62% in quarter 2 as shown in table 2. The highest No. of relapse cases 5.09% was recorded in quarter 3, followed by 4.76% in quarter 1, 4.58% in quarter 2 and 2.58% in quarter 4.

Table 1: Distribution of total cases and gender wise occurrence of TB patients reported during 1<sup>st</sup> January 2013 to 31<sup>th</sup> December 2013 in District Dir (Lower)

Total No of cases	Positive cases	Males	Females
1378	612 (44.41%)	268 (43.79%)	344 (56.21%)

Table 2: Quarter wise distribution and type of TB patients cases in Dir (Lower) from 1<sup>st</sup> January 2013 to 31<sup>th</sup> December 2013 in District Dir (Lower)

Quarter wise distribution	Total No of cases studied	Positive cases	Distribution based on TB patients type				
			New cases	Relapses	After failure	After default	Others
Quarter 1(January-March)	329	147 (44.68%)	140 (95.24%)	7 (4.76%)	0	0	0
Quarter 2 (April-June)	359	153 (42.62%)	144 (94.12%)	7 (4.58%)	0	1 (0.65%)	1 (0.65%)
Quarter 3 (July-September)	362	157 (43.37%)	148 (94.27%)	8 (5.09%)	0	0	1 (0.64%)
Quarter 4 (October-December)	328	155 (47.26%)	150 (96.77%)	4 (2.58%)	1 (0.65%)	0	0
Total	1378	612 (44.41%)	582 (95.10%)	26 (4.25%)	1 (0.16%)	1 (0.16%)	2 (0.33%)

Table 3: Age wise distribution of new pulmonary sputum smear positive TB patients in District Dir (Lower)

Age groups (years)	0-14	15-24	25-34	35-44	45-54	>=55	Total
Males	9 (3.57%)	55 (21.83%)	34 (13.49%)	46 (18.25%)	53 (21.03%)	55 (21.83%)	252
Females	27 (8.18%)	82 (24.85%)	60 (18.18%)	68 (20.61%)	41 (12.42%)	52 (15.76%)	330
Total	36 (6.19%)	137 (23.54%)	94 (16.15%)	114 (19.59%)	94 (16.15%)	107 (18.38%)	582

While no case F, D and O were reported in quarter 1. According to our results in quarter 2 one case of each D and O were reported where no case of F were observed. In quarter 3 only one case of O, while no case of F and D were observed. One case with F was seen in quarter 4, where no case with D and O were observed (Table 2).

Age wise analysis of the new pulmonary sputum smear positive cases showed that highest No. of cases 137 (23.54%) was recorded in age 15-24 years followed by 114 (19.59%) in age 35-44 years, 107 (18.38%) in age >=55 years, 94 (16.15%) in 25-34 years and 45-54 years and 36 (6.19%) in 0-14 years as shown in Table 3.

### DISCUSSION

In the current study the rate of infection was high 44.41% in general population of District Dir (Lower). The overall prevalence rate of our study is higher than others studies [4-7]. Shams *et al.* [4] reported 33.08% prevalence of TB infection in District KharBajaur Agency. A study conducted in the selected area of District Dir (Lower) reported that the overall prevalence rate was 34.71% [5]. Ahmad *et al.* [6] reported 36.82% prevalence rate of TB in District Dir (Lower). Another study was carried out in Dir (Lower), out of total suspected cases 38.51% were positive for TB [7]. In our study the females were more infected 56.21% as compared to males 43.71%. The result of our study is similar with other studies reported high rate of infection of TB in females rather than males population [4,6-12]. Comparison of our study shows that the rate of TB infection increases in Dir (Lower) which shows a significant health hazard. There are some common factors which contribute to the spread of disease in the said area. The poor hygienic condition, poverty, left of treatment, no early diagnosis and treatment and poor medical facilities may put the huge number of peoples at risk.

Our results showed that 23.54% N cases of pulmonary TB were reported between 15-24 years. Higher rate was recorded by Shams *et al.* [4], 42.67% in age between 11-20 years. This result agrees with Ahmad *et al.* [5], in age 20-29 years 23.7% of cases were observed, by Ahmad [7], 24.37% cases in age >10-20 years and Ahmad

*et al.* [6], 23.14% cases from age group >10-20 years. The results showed that TB infect the most productive and economically age group of District Dir (Lower). The common reason for that the young age groups ignore the disease, left the treatment before completion etc. The quarter wise distribution showed no significant difference in the current study.

### CONCLUSION

From our findings, it was concluded that the rate of TB infection was significantly increased in general population of District Dir (Lower). If the proper management wasn't done so it may affect a large No. of peoples in the said area. On other side the female were more susceptible victims for TB infection. The TB infects the most productive and economically important age group of the said area.

### ACKNOWLEDGEMENT

We are very grateful to District Head Quarter Hospital Timergra for their support in this study.

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