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Original Research Article

Prevalence of Tuberculosis in the Population of District Kohat and Lower Orakzai Agency

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Abstract

This study was aimed to find out the Prevalence of Tuberculosis in Kohat and lower Orakzai Agency. The survey was conducted at District Headquarter Hospital Kohat and Tehsil Headquarter Hospital Lower Orakzai Agency Kalaya. It was 12 weeks survey which extended from March 2014 to June 2014. Data was collected from the TB Center of the both Hospital. A total of one hundred and six histories were collected for the process of evaluation. Out of a total 106 patients, 59 patients (55.66%) were sputum positive and 47 patients (44.33%) were sputum negative. Among these 106 cases, 52 patients (49.05%) were females and 54 patients (50.94%) were males. Twenty eight individuals (26.41%) were between 1-20 years of age, Forty one individuals (38.67%) were between 21-40 years of age, Twenty nine individuals (27.35%) were between 41-60 years of age, Seven individuals (6.60%) were between 61-80 years of age and only One individual (0.94%) was between 81-100 years of age. Majority of the individuals were between 21-40 ages i.e. 41 (38.67%). Majority of the patients were members of poor, deprived and lower local class. The chief presenting symptoms were productive cough, coughing with blood, fever, weight loss, tiredness but some there were also some cases which could not be identified through symptoms. Sputum AFB positive pulmonary tuberculosis is more in individuals of low socioeconomic group and in females. The patients put their children and family members at risk of tuberculosis infection. For the control of this disease early diagnosis of active disease and their treatment under supervision is important.

Keywords: AFB, District Kohat and Lower Orakzai Agency, Prevalence, Tuberculosis

INTRODUCTION

Tuberculosis is a chronic, fatal infectious disease caused by *Mycobacterium Tuberculosis* (MTB) (Kumar, V., et al. 2007). *Mycobacterium Tuberculosis* is the agent which causes TB, a small, aerobic, non-motile bacillus (Dolin et al., 2010). Mycobacterium divides every 16-20 hours which is a very slow rate as compared to other bacteria which usually divides in less than an hour (Jindal, 2011). The outer membrane of Mycobacterium has a lipid bilayer (Niederweis et al., 2010). In gram staining MTB either stains very weakly gram positive "or does not retain dye due to high lipid and Mycolic acid content in the cell wall. MTB retains certain dyes when it is treated with acidic solution and called acid fast bacillus (AFB) (Madison, 2001). Ziehl–Neelsen (ZN) stain is the staining used for AFB (New Delhi: Tata McGraw-Hill. 2000). For fluorescence microscopy use auramine-rhodamine staining. The *Mycobacterium Tuberculosis* complex (MTBC) includes four other TB causing Mycobacteria: *M. Bovis*, *M. Africanum*, *M. Canetti*, And *M. Microti* (Van Soolingen et al., 1997). *M. Leprae*, *M. Avium* and *M. Kansasii* are non-tuberculosis mycobacterium which neither cause TB nor leprosy but they cause pulmonary

disease that resemble TB. Tuberculosis can attack the lungs as well as other parts of the body. It can spread from one person to another by air who have an active TB infection cough, sneeze (Konstantinos, 2010). About one third of the world's population is infected with *Mycobacterium Tuberculosis* (WHO. Nov 2010). Each year about 1% of the population is infected with this disease (WHO. 2002). In 2007, it was estimated that 13.7 million are infected with this disease globally (WHO, 2009). While in 2010 it was estimated that 8.8 million people were infected with this disease and1.5 million deaths associated with this disease, mostly in developing countries. Since 2006 the absolute number of cases has been decreasing and since 2002 new cases have decreased (WHO. 2011). The rates of tuberculosis varies across the globe in different areas; the tuberculin test was positive in many Asian and African countries about 80%, while in United States only 5-10% of population tests positive (Kumar, V., et al 2007). Due to high rates of HIV infection and the corresponding development of AIDS, the immune system of the person is weak due to which the person contract tuberculosis (Lawn and Zumla, 2011). Tuberculosis can infect the lungs called *Pulmonary Tuberculosis.* Tuberculosis develops outside the lungs called *Extrapulmonary Tuberculosis*. Fever, chills, night sweats, loss of appetite, weight loss, and fatigue are the general sign and symptoms (Dolin et al., 2010). Tuberculosis can infect the lungs called *Pulmonary Tuberculosis* and symptoms are Chest pain and prolonged cough. About 25% of people have asymptomatic symptoms (Lawn and Zumla, 2011; Behera, 2010). Tuberculosis is a chronic disease which affects the upper lobes of the lungs than the lower ones (Dolin et al., 2010). The rate of *Extrapulmonary Tuberculosis* is about 15-20% (Jindal, 2011). *Extrapulmonary Tuberculosis* is more common in immuno suppressed persons and young children in those with HIV is about 50% (Golden and Vikram, 2005). Tuberculosis ulcer is the bursting of tubercular abscess in the skin. The ulcer which originate from nearby lymph nodes is painless, slowly enlarging and has an appearance of "wash weather" (Burkitt, 2007). The wide spread form of TB is called "disseminated" commonly called *Miliary Tuberculosis* which is potentially more serious (Dolin et al., 2010). The most important risk factor is HIV globally; 13% of all people with TB are infected by the virus (WHO. 2011). So the rate of HIV is higher in Sub Saharan Africa (WHO. 2006; Chaisson et al., 2008). Those people who do not have HIV and infected with TB is about 5-40% which develop active disease in their life. Those people who are infected with HIV about 30% can develop active disease (Peter et al., 2005). TB has more chances in those people who smoke cigarette than non-smokers (Van ZylSmit et al., 2010). Tuberculosis is principally called the disease of poverty because it is closely linked with overcrowding and poverty. The risk of TB can be increase by alcoholism and diabetes mellitus (Lawn, SD., Zumla, and Al. 2 July 2011) (Restrepo, BI. 15 August 2007). Those people who are infected with active pulmonary TB when cough, sneeze, or spit, they release up to 40,000 droplets (Cole and Cook, 1998), and each droplet has the ability to cause TB disease (Nicas *et al.,* 2005). Those peoples who are in close contact with TB infected peoples are at high risk of becoming infected i.e. 22% infected rate. If treatment is done for two weeks then the infection is not consider to contagious to others (Ahmed and Hasnain, 2011). TB disease can be transfer from infected person to the normal one by aerosols while latent infections are not the contagious one (Kumar et al., 2007). *Mycobacterium* cause 90% asymptomatic infection, latent TB infections and only 10% of latent TB infection will progress to active TB infections (Skolnik, 2011; Arch et al., 2009). If the treatment of active TB is not done then death rate will be 66% (WHO, 2010). When *Mycobacterium* reach the pulmonaryor lungs then TB infection take place and replication takes place within the endosomes of alveolar macrophages. Ghon focus is the site of infection in lungs which is either located on the upper part or lower lobe (Kumar et al., 2007) (Houben et al., 2006). The infection caused by blood stream is called Simon focus and on the top of the lung (Khan, 2011). If TB bacteria get entry into blood stream from a damaged tissue then they can spread to the whole body parts and appear tiny, white tubercles in the tissues (Crowley and Leonard, 2010). This severe form is called miliary TB which is common in young children (Anthony and Harries, 2005). Diagnosis of active TB can be done on the basis of sign and symptoms while diagnosis is very difficult in those who are immune suppressed.

MATERIAL AND METHODS

The current survey was conducted at District Headquarter Hospital Kohat and Tehsil Headquarter Hospitals of Lower Orakzai Agency Kalaya. It was 12 weeks survey which extended from March 2014 to June 2014. Data was collected from the TB Center of both Hospitals. A totalof one hundred and six histories were collected for the process of evaluation. Daily visits were paid to TB center. Complete information was collected about patients and their diseases. For collection of data, the patients were interviewed about their condition.

RESULTS

Out of a total 106 patients, 59 patients (55.66%) were sputum AFB positive and 47 patients (44.33%) were sputum negative (Table 1).

Among these 106 cases, 52 patients (49.05%) were females and 54 patients (50.94%) were males. Which

Table 1. Patients with sputum AFB positive result out of 106 patients

Sputum smear result	Total Number	%age
AFB positive	59	55.66
AFB negative	47	44.33

Table 2. Sex wise distribution of 106 sputum AFB positive patients

Sex	Total Number	%age
Male	54	50.94
Female	52	49.05

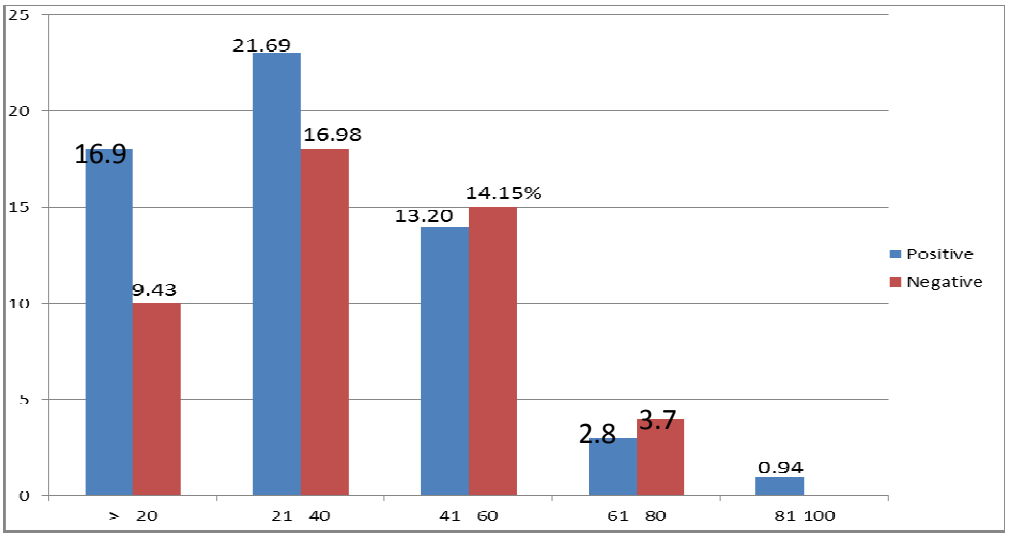

Figure 1. Age wise distribution of 106 sputum AFB positive patients Figure 1

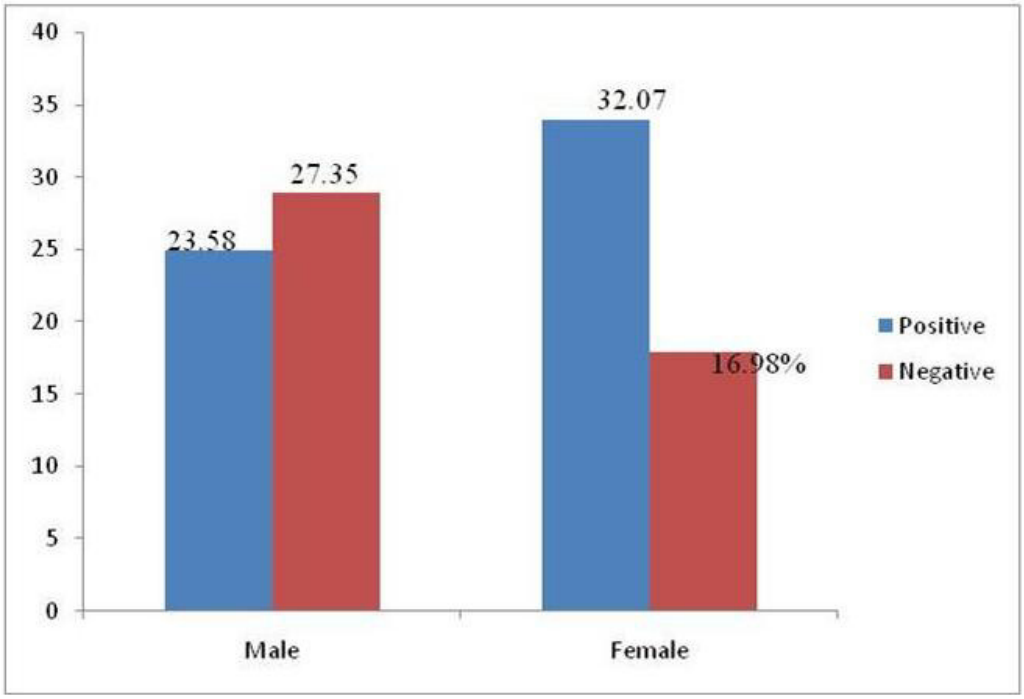

Figure 2. Sex distribution of 106 sputum AFB positive patients

show that male is more suspected as compared to female.

Twenty eight individuals (26.41%) were between 1-20 years of age, Forty one individuals (38.67%) were between 21-40 years of age, Twenty nine individuals (27.35%) were between 41-60 years of age, seven individuals (6.60%) were between 61-80 years of age and only one individual (0.94%) was between 81-100 years of age. Majority of the individuals were between 21-40 ages i.e. 41 (38.67%).

Among these 106 cases, total 59 cases were males in which 25 cases were AFB positive and 29 cases were AFB negative while 52 cases were females in which 34 were AFB positive and 18 cases were AFB negative. (Figure 2)

DISCUSSION

Tuberculosis is a vital disease as it has caused more deaths than any other infectious disease and 95% of these deaths are in the developing countries of the world. In Pakistan it is the fourth major death causing disease. The best way of controlling TB in our country is to do early diagnosis and effective treatment of active cases particularly pulmonary, which is infectious to the community. The main reasons of increased risk of infection, high death rate and MDR cases in Pakistan are the delay in diagnosis and inability to cure a high proportion of pulmonary smear positive cases. Currently for diagnosis, developing countries rely on AFB stains and culture (where available) and radiographic changes. ZN-stainingis a rapid, simple and cheap way of diagnosing pulmonary tuberculosis but it lacks sensitivity; still it is the most rewarding method if performed by an experienced microbiologist.

Out of a total 106 patients, 59 patients (55.66%) were sputum AFB positive and 47 patients (44.33%) were sputum negative (Table 1). Though the validity of the AFB positivity on sputum specimens may be questioned, because they were not confirmed by culture for AFB, this was thought not be the case as patients with the possible diagnosis of tuberculosis only on clinical, laboratory and radiological grounds were included in the study.

In another study by Asch,. S and colleagues (Los Angeles 1998), 56% patients had positive sputum AFB results. This study was done on homeless patients and the increased frequency as compared to my study could be because of the selection of high-risk patients.

Among these 106 cases, 52 patients (49.05%) were females and 54 patients (50.94%) were malesthat match with the sex distribution of TB patients noted by Akhtar T and colleagues (1994) and Ahmed M and colleagues. These findings are in agreement with earlier findings that tendency todisease and mortality from TB is higher in females as compared to males. In addition, early marriages and multiple pregnancies put extra burden on the defense leaving them more vulnerable to develop TB. TB in women puts their children and family members at risk of tuberculosis infection, disease and death. This triple threat makes detection and treatment of TB in a woman absolutely vital. As compared to a developed country, where TB is common among elderly, it is a disease of young in a developing country. Twenty eight individuals (26.41%) were between 1-20 years of age, Forty one individuals (38.67%) were between 21-40 years of age, Twenty nine individuals (27.35%) were between 41-60 years of age, seven individuals (6.60%) were between 61-80 years of age and only one individual (0.94%) was between 81-100 years of age. Majority of the individuals were between 21-40 agesi.e. 41 (38.67%). The chief presenting symptoms were productive cough, coughing with blood, fever, weight loss, tiredness but some there were also some cases which could not be identified through symptoms. Sputum AFB positive pulmonary tuberculosis is more in individuals of low socioeconomic group and in females. The patients put their children and family members at risk of tuberculosis infection. For the control of this disease early diagnosis of active disease and their treatment under supervision is important.

CONCLUSION

- Sputum AFB positive pulmonary TB is more in females, in young age individuals, and in people of low socio economic group.
- Acid fast staining of sputum is the best method, if performed by experienced microbiologist, as it is reliable and economical. Its diagnostics yield can be increased by liquefaction and centrifugation of sputum and by examining more than one sample.
- It will be more effective to avoid living in small and congested houses. There should be no more than two or three persons living in a single room.
- The patient should take the medication as prescribed by the prescriber on time and should wear safety masks to avoid transferring of the disease to other individuals.
- For the control of tuberculosis, early diagnosis of active cases and their treatment under supervision is important

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