ORIGINAL ARTICLE
DEMOGRAPHICS OF TUBERCULOSIS IN DISTRICT MANSEHRA

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Background: Tuberculosis is one of the leading causes of morbidity and mortality across the globe. Pakistan is one of the 22 high tuberculosis burden countries of the world sharing more than 80% of the global burden of tuberculosis. **Methods**: This study was a retrospective case-based study that analyzed secondary data obtained from TB-03 form at the office of the District Tuberculosis Control Officer (DTO), Mansehra. Data was entered into SPSS-20 and analysed. **Results**: A total of 625 patients with a mean age of 32.1±19.1 years were registered at the DTO office during the year 2013. Most of the patients were female (57%) as compared to males (43%). The most common treatment outcome was "treatment completed", recorded against 56% of the patients. The proportion of patients declared "cured" at the end of the treatment was 236 (37.8%). There were only 4 (0.64%) cases of treatment failure during 2013. **Conclusion**: Despite falling incidence of tuberculosis and mortality across the globe, tuberculosis is still a major determinant of disease in our society. Aggressive case detection and treatment is needed to manage this disease.

Keywords: Tuberculosis, Death, Lost to follow up, Mortality, DOTS, Sputum Smear Positive, Re-treatment cases.

INTRODUCTION

Molecular evidence suggests that tuberculosis was present 17,000 years ago and even today, tuberculosis is one of the leading killer among infectious diseases.[1] During the year 2012, the number of newly diagnosed tuberculosis patients was 8.6 million and during the same year tuberculosis resulted in more than one million deaths worldwide[2] with less than 5% of these deaths in high income countries.[3] Traditionally, tuberculosis has been associated with malnutrition, over-crowding and poverty.[4,5] A downward trend has been noted in the incidence of tuberculosis[2,5], and its case-fatality rate comparing with the figures of 2010.[4]

Pakistan is one of the 22 high tuberculosis burden countries contributing to more than 82% of the global tuberculosis burden.[6] In 2011, the case detection rate was 64% for all types of tuberculosis across the Pakistan with an estimated incidence rate of 230 cases per 100,000 population.[7] However, these estimates have recently been revised and a calculated tuberculosis incidence rate of 497 cases per 100,000 population has been suggested.[8] The increasing trend in the incidence rate in Pakistan is a matter of concern as the global incidence of tuberculosis has been falling steadily since 2002 at a rate of 1.3% per year.[5]

The latest guidelines by the World Health Organization (WHO) for the treatment of tuberculosis define a definite case of tuberculosis as a "patient with *Mycobacterium tuberculosis* complex identified from a clinical specimen, either by culture or by a newer method such as molecular line probe assay.[9]" The tuberculosis cases can further be categorised in different ways for example, the anatomical site, the bacteriological status and on the basis of history of previous treatment. Pulmonary Tuberculosis is defined as a case of tuberculosis with disease confined to lung parenchyma. Extra pulmonary tuberculosis involves tuberculosis pleural effusion and/or intra-thoracic lymphadenopathy due to tuberculosis in the absence of pulmonary parenchymal lesions as well as tuberculosis of organs other than lungs.[9]

Likewise, tuberculosis in a patient is labelled as smear-positive tuberculosis if one or more sputum smears are positive for *Mycobacterium tuberculosis* at the start of treatment. Patients whose sputum smears are not positive for *Mycobacterium tuberculosis* can still have tuberculosis and are usually treated as smear-negative tuberculosis provided they fulfil certain criteria.[9] Similarly new patients of tuberculosis are those who either have never taken anti-tuberculosis treatment or have taken it for a period not exceeding or equal to one month. Re-treatment or previously treated cases of tuberculosis are those who had previously completed a course of tuberculosis and were either declared cured before being diagnosed with tuberculosis again, were lost to follow-up or were found to have treatment failure. Patients who do not fit in any of the well defined categories are usually put in another category called "others".[9] Another method of identifying patients with tuberculosis is to categorize the patients on the basis of past history of tuberculosis and its outcome. Category 1 patients are those patients who usually have not taken any treatment for tuberculosis in the past and have been diagnosed with tuberculosis for the first time. These patients may have pulmonary tuberculosis, extra-pulmonary tuberculosis or smear-negative tuberculosis. Category 2 tuberculosis patients usually give a history of having completed in the past a treatment of

tuberculosis with varying results. These patients may have been declared cured, were lost to follow-up and or had category-1 treatment failure or fall into the "others" (ss+) category. Many risk factors have been identified, which, if present make an individual prone to acquisition and development of tuberculosis. These risk factors include, in addition to well-known risk factors such as malnutrition, younger age, and presence of HIV infection, tobacco smoking, indoor air pollution, diabetes mellitus, immuno-suppressive drugs[10,11] and the use of alcohol.[12]

The traditional tuberculosis control strategies aim to decrease the tuberculosis incidence by diagnosing and treating the infectious cases of tuberculosis as early as possible.[13] It is recommended that the newly diagnosed tuberculosis patients should be treated for at least 6 months of daily dosing of a drug regimen containing Rifampicin.[9] The treatment duration and drugs combination for re-treatment cases are different.[9] The tuberculosis control programmes in various countries have adopted an aggressive plan for its early diagnosis and treatment to minimize its spread. Most attention is paid on smear-positive pulmonary tuberculosis patients being an important source of TB spread as compared to the smear-negative tuberculosis patients.[14] Although Tuberculosis is a major risk factor for morbidity and mortality in Pakistan with a significant economic impact, the epidemiological data available is little and lacks reliability as well.[15,8]

This retrospective case-based study was conducted with a view to analyze the state of tuberculosis control in district Mansehra in the year 2013. For this purpose, secondary data from the District Tuberculosis Office (DTO), Mansehra was acquired and analyzed.

MATERIAL AND METHODS

This was a retrospective register-based study that used secondary data obtained from TB-03 TB register from the DTO Mansehra from 1st January to 31st December 2013. All types of tuberculosis cases were included. Based on the results of sputum smear, three categories of tuberculosis patients were identified: sputum smear-negative, smear-positive and those whose sputum was not done. Data was analysed by using SPSS V. 20.

RESULTS

A total of 625 patients were registered with the DTO office Mansehra during 2013 for the treatment of tuberculosis with a mean age of 32.1±19.1 years. Gender wise age related statistics is presented in Table 1. Urban, rural and age group wise distribution of the patients is shown in Table 2. Pulmonary Tuberculosis was diagnosed in 466 (74.6%) patients while 159 (25.4%) patients were registered with extra-pulmonary tuberculosis. Data regarding sputum smear microscopy

is shown in Table 3. For the purpose of treatment, 597 (95.5%) patients were registered as category-1 patients and only 28 (4.5%) were treated as category 2 patients.

Majority 534 (85.4%) of the patients were registered as new cases. Patients placed in the "others" category were 56 (9.0%) followed by 27 (4.3%) re-treatment cases and 8 (1.3%) patients had been transferred out during the year. The treatment outcome of the patients with pulmonary and extra-pulmonary tuberculosis is shown in table-4.

The data revealed that 464 (74.2%) patients were from economically productive age. The female patients with tuberculosis outnumbered male patients in this study however this difference was not found to be statistically significant in terms of site of tuberculosis, type of tuberculosis and outcome of treatment for tuberculosis ($p > 0.05$).

Table-1: Gender wise age related statistics

Gender	Frequency (%)	Mean±SD
Male	269 (43.04)	34.5±21.2
Female	356 (56.96)	30.2±17.3
Total	625 (100)	32.1±19.1

Table-2: Area and age group wise distribution of patients

Area	Frequency (%)
Area	
Rural	463 (74.1)
Urban	162 (25.9)
Total	625 (100)
Age groups	
<15 years	101 (16.2)
15-64 years	464 (74.2)
>64 years	60 (9.6)
Total	625 (100)

Table-3: Smear status of patients with tuberculosis

Smear status	Frequency (%)
Smear Positive	311 (49.8%)
Smear Negative	152 (24.3%)
Smear Not Done	162 (25.9%)
Total	625 (100%)

Table-4: Outcome of treatment of tuberculosis in patients with pulmonary tuberculosis

Treatment outcome	Pulmonary Tuberculosis Frequency (%)	Extra-Pulmonary Tuberculosis Frequency (%)
Cured	236 (50.6%)	0
Treatment Completed	192 (41.2%)	158 (99.4)
Treatment Failure	4 (0.9%)	0
Default	8 (1.7%)	0
Died	10 (2.1%)	0
Transferred	16 (3.4%)	1 (0.6)
Total	466 (100%)	159 (100)

DISCUSSION

Pakistan ranks 5th among the 22 high tuberculosis burden countries in the world and the grimness of this situation is indicated by the fact that recently the tuberculosis case incidence was estimated to be 497 per

100,000 population in Pakistan.[8] The efforts of tuberculosis control in Pakistan are in line with the efforts globally as a result of which a 45% reduction in global mortality due to tuberculosis has been observed in addition to falling incidence of tuberculosis.[16] However, the tuberculosis incidence rates are still very high.[8]

The increased incidence of tuberculosis in Pakistan can be partly attributed to the delays in detection and treatment of cases of tuberculosis. A study from China noted a number of risk factors associated with the delays in detection and treatment of tuberculosis which included little or no knowledge of tuberculosis, poor personal health due to inadequate knowledge, beliefs based on traditions and cultures, inadequate access to healthcare and stigmatization associated with tuberculosis.[17] Similar risk factors have been noted in a study from Pakistan.[18]

A study conducted in Dir Lower suggest 82.73% of the tuberculosis patients are in the productive age group (15–64 years).[19] The situation was not different significantly in this study where 464 tuberculosis patients who made up 74.2% of the study population were aged between 15–64 years.

In this study, majority of patients with tuberculosis were females and they comprised of 57% of the population. This observation is not supported by a study from the same region by Tariq et al[20], where 55.4% were males as compared to 44.6% females. More than three quarters (380; 76%) of these patients were diagnosed with pulmonary tuberculosis.[22] While the results are similar to this study as far as type of tuberculosis is concerned viz-a-viz Pulmonary or extra-pulmonary tuberculosis, the difference in the involvement of sexes can be explained on the basis of fact that the said teaching hospital receives patients from a large area and access to healthcare is usually difficult for females in our society.[20]

The mean age of the study population was 32 years which is also reflected in a study conducted at the Lady Reading Hospital Peshawar that reported mean age of 35 years.[22] Interestingly, females diagnosed with tuberculosis constituted the majority of study population (66.48%). Similarly, the age of more than two-thirds of the study population (70.28%) fell in the 15-45 years age group.[22]

The study population comprised of patients with extra-pulmonary tuberculosis[21] and in our study most of the patients were diagnosed with pulmonary tuberculosis.

Another study from Chakdara, Dir reported that the prevalence of tuberculosis was more in males (52.64%) as compared to females (47.36%).[23] The researchers also reported that 73.33% of patients aged 20-40 had tuberculosis.[23] While the results of that study partially confirm the finding in our study, it is evident

that tuberculosis affects young adults in a given setting. It is more a disease of the young as compared to older population.

While the magnitude of the disease is being reviewed as a result of more aggressive policies adapted by the National TB control programme[9], there are certain factors that affect the spread of tuberculosis among people. These factors include the knowledge of the disease itself, the level of health education about prevention of disease, availability of healthcare resources and socioeconomic condition of the patient.[23]

Many studies have noted a high prevalence of tuberculosis in females but the reasons for an increased prevalence of tuberculosis in females are yet to be discovered. Some researchers think that the biological differences between the two sexes as well as the socio-cultural gender-based roles make women prone to acquiring tuberculosis in our society.[22] Although pulmonary as well as extra-pulmonary tuberculosis has been documented in females[22] in our study, Pulmonary tuberculosis was more common (74.2%) as compared to extra-pulmonary tuberculosis among females. Importantly, all treatment failures (4 cases) that were recorded in 2013 were females. This could be explained on the basis of the socio-cultural gender-based roles played by the females in our society.

CONCLUSION

Tuberculosis is one of the key determinants of morbidity and mortality in our region. Its high prevalence should not allow us to lower our guards. Targeted efforts to detect new cases of tuberculosis among females to allow for timely detection and treatment of tuberculosis should be the focus of TB / Chest physicians.

AUTHOR'S CONTRIBUTION

All the authors contributed equally

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