Section: Respiratory Medicine

Original Research Article

EVALUATION OF CLINICAL PROFILE OF PATIENTS WITH MULTIDRUG RESISTANT TUBERCULOSIS IN A TERTIARY CARE TEACHING HOSPITAL STUDY

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ABSTRACT

Background: India has had a lot of cases of Drug Resistant Tuberculosis (DR-TB), which has been known about since anti-TB medications were first developed to treat tuberculosis. A man-made phenomena, multidrug-resistant tuberculosis (MDR-TB) has emerged as a significant obstacle to India's successful tuberculosis control. **Materials and Methods:** The present research was a descriptive, observational, hospital-based study that involved patients who were seen in the TB and chest outpatient departments. The drug-resistant TB cases were verified using the Gene-expert assay or the Line Probe Assay (LPA). **Results:** A total of 56 patients with MDR-TB were enrolled in the current study based on the study criteria, and all of their records were recorded into a proforma. Ages 20–29 accounted for 35.7% of the total, followed by 30-39 (28.07%) and 40–49 (16.07%). In the extreme age groups of those under 19 (7.14%) and those over 60 (3.6%), the incidence was comparatively low. **Conclusion:** Males in their middle years who have a history of smoking, drinking, COPD, or diabetes are more likely to have MDR-TB. The success rate varies and is mostly dependent on early discovery and careful monitoring. Standard treatment can lower morbidities and mortality.

INTRODUCTION

According to estimates from the Global TB Report 2016, India has the greatest burden of both TB and MDR TB.[1] A significant public health issue, Multi-Drug Resistant Tuberculosis (MDR-TB) is a strain of Mycobacterium tuberculosis that is resistant to both isoniazid and rifampicin. In addition to being expensive and challenging to diagnose, MDR-TB has higher morbidity and mortality rates than drug-susceptible TB and is also challenging to cure. One-fourth of the world's TB cases are in India. In March 2006, the Directly Observed Treatment Short Course (DOTS) technique was approved by the Revised National Tuberculosis Control Program (RNTCP) and implemented nationwide. However, MDR-TB has presented a problem; an estimated 71,000 MDR-TB cases are reported from pulmonary TB patients in India each year, making India the nation with the greatest MDR-TB burden at this time.[2] The main causes of the TB epidemic and the outcomes of therapy include poverty, malnutrition, HIV infection, and smoking. The most significant contributing factor to MDR-TB is prior, potentially insufficient antitubercular medication treatment.[3] HIV coinfection, related diabetes mellitus, poor socioeconomic class groups, intravenous drug abusers, various immune-compromised conditions, etc. are additional significant factors. MDR-TB patients needed to have expensive, 24-month treatment, which could lead to social exclusion, job loss, long-term socioeconomic consequences, and increased death.[4] Poor management of adverse drug responses and adverse drug reactions on second-line anti-tuberculosis medications resulted in irregular treatment adherence, raising the chance of default and potentially causing death and long-term morbidity.[5] The success rates of drug-resistant tuberculosis treatment vary greatly as a result of all these factors.[6] However, according to WHO, India's overall success rate is 46%.[7] The purpose of the current study was to assess the clinical characteristics and treatment results of drug-resistant TB patients receiving standardized MDR-TB treatment at a tertiary care facility.

MATERIALS AND METHODS

The present prospective and observational study was conducted in the Department of Respiratory

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Medicine, World College of Medical Sciences Research and Hospital, Jhajjar. The study included all drug-resistant TB patients that were verified using the Gene-expert assay or the Line Probe Assay (LPA). The study excluded participants with extensive drug-resistant TB (XDR), those unwilling to follow a standardized MDR-TB regimen, and those who did not give their agreement to be included in the study population. Pretreatment evaluation records were the source of all MDR-TB case records. Pre-treatment studies (complete blood count, urine examination, serum electrolytes, renal function tests, serum TSH, etc.) were gathered for every MDR-TB case history. A standardized regimen consisting of an intensive phase of 6–9 months with kanamycin, levofloxacin, ethionamide, pyrazinamide, ethambutol, and cycloserine, followed by an 18-month continuation phase with daily doses of ethambutol, levofloxacin, ethionamide, and cycloserine was used to treat all MDR-TB cases. Patients with MDRTB were treated in accordance with WHO 2013 guidelines.[8] A patient is considered cured if they completed MDR-TB treatment, had a culture-negative result in the final month of treatment, and had a culture-negative result during the previous 11 months of treatment. Having finished MDR-TB treatment, the patient did not fulfill the criteria for cure or failure because they did not have any bacteriologic results.

Treatment failure is characterized by at least five cultures being performed in the past 12 months, multiple positive cultures during the course of treatment, or a patient who is consistently culture-positive and a therapeutic choice to stop treatment early has been made. All of the patient data was entered into a proforma. A statistical study was carried out.

RESULTS

Out of the 56 individuals, 30 (53.6%) were men and 26 (46.6%) were women. The ratio of men to women was 1.15:1. The mean age for all was 31.56±6.24, with a minimum age of 11 and a maximum age of 65. A total of 56 patients with MDR-TB were enrolled in the current study based on the study criteria, and all of their records were recorded into a proforma. Ages 20–29 accounted for 35.7% of the total, followed by 30-39 (28.07%) and 40–49 (16.07%). In the extreme age groups of those under 19 (7.14%) and those over 60 (3.6%), the incidence was comparatively low.

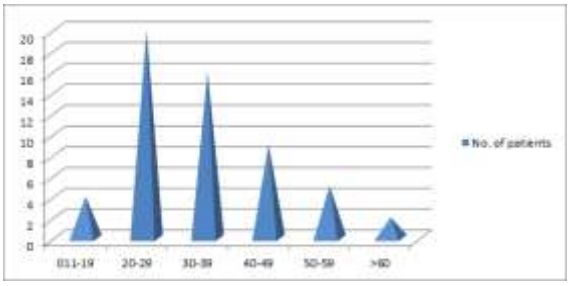

Figure 1: Shows the demographic characteristics of the subjects

The most common symptoms observed were fever (56 (100 %), cough 54 (96.42 %), expectoration 53 (94.64 %), anorexia 47 (83.92 %), weight loss 41 (73.21 %).

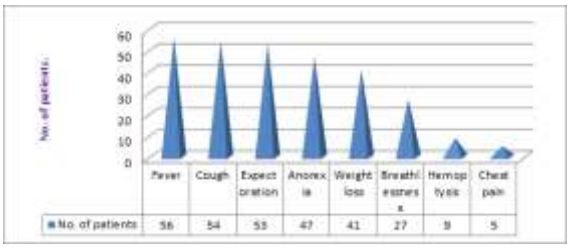

Figure 2: Shows the sign and symptoms profile of the subjects

In the current study, we found that the incidence of addiction was 21 (37.5%) for smoking, 17 (30.35%) for drinking, and 19 (33.92%) for chewing tobacco. While smoking damages the lung parenchyma, addictions mostly impact treatment compliance. 52 individuals (92.85%) had pulmonary MDRTB, while the remaining 4 patients (7.14%) had extra-pulmonary MDRTB. In the current study, additional co-morbidities were diabetes 9 (16.07%), COPD 8 (14.3%), positive HIV status 6 (10.71%), and others 4 (7.14%).

Table1: Shows the other characteristics of the subjects

Characteristics		No. of patients (%)
Addiction	Smoking	21 (37.5%)
	Alcohol	17 (30.35%)
	Tobacco Chewing	19 (33.92%)
Site of disease	Pulmonary	52 (92.85%)
	Extra Pulmonary	4 (7.14%)
Co Morbidities	Diabetes	9 (16.07%)
	COPD	8 (14.3%)
	Positive HIV Status	6 (10.71%)
	Others	4 (7.14%)

The following treatment outcomes were recorded: 31 patients were cured (55.35%), 21 patients had therapy completed (37.5%), and 4 patients defaulted (7.147%). Sixty-seven percent of patients had successful treatment.

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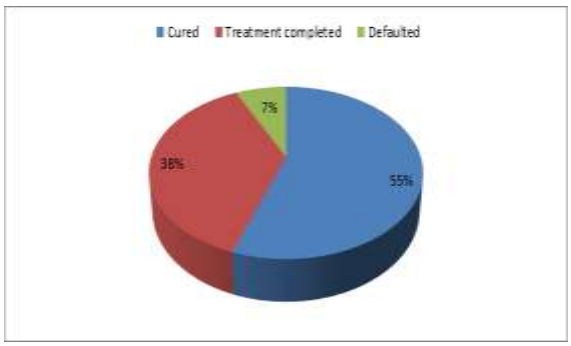

Figure 3: Shows the outcomes of treatment for MDRTB patients receiving a standardized protocol

DISCUSSION

Countless advancements in detection and treatment, tuberculosis mortality is still high. With 5,000 fatalities every day, TB was named the deadliest infectious illness by the WHO in 2016.[7] MDR-TB is a significant obstacle to the disease's efficient management. To control the disease, MDR-TB cases must be managed promptly and appropriately, requiring rigorous adherence to treatment. Compared to other age groups, middle age groups (20–39 years) with a mean age of 31.56 ± 6.24 years were frequently impacted in this study. In their study, Mukherjee et al,[9] found that MDR-TB was most frequent in the 20–29 age range, with a mean age of 32.52% years. According to research by Gaude et al,[10] and Sharma et al,[11]similar age groups with mean age were also frequently impacted. In this study, there were 30 male patients (53.6%) and 46.4% female patients. The ratio of men to women was 1.15:1. Datta et al.'s investigation revealed male-dominated involvement.[12]In comparison to women, men engage in more outdoor activities and engage in high-risk behaviors like drunkenness and smoking, which can be used to justify male dominance. A known risk factor for tuberculosis is smoking, which has been shown to double the risk of developing active tuberculosis.[13] Studies have also shown that drinking alcohol, which includes 40 grams or more of alcohol per day, can increase the risk of developing tuberculosis by up to three times.[14] A statistically significant correlation between alcohol usage and MDR TB was also found in other investigations.[15] Our study group's most prevalent comorbidities were positive HIV status (10.71%), COPD (14.3%), and diabetes (16.07%). According to a study by Datta et al., 7.14% of people had diabetes as a comorbid condition.[12] Additionally, it was discovered that the most prevalent concomitant condition among MDR-TB cases was COPD. Since HIV-positive individuals have a significantly worse survival rate than non-infected individuals and HIV testing is advised for all TB patients, MDR-TB has been a major issue for these individuals worldwide.[16] According to Datta et al., there is a dearth of information on HIV in MDR-TB in India.[12]Stating that 1.9% of MDR-TB cases had HIV seropositivity. Nonetheless, 12.5% of MDR-TB patients in this research tested positive for HIV. Any one of the three techniques can be used to identify drug-resistant tuberculosis. These include cartridge-based nucleic acid amplification tests, GeneXpert tests, or the gold standard LJ culture, liquid culture (Mycobacterium Growth Indicator Tube), or molecular genotyping tests like LPA. Detecting MDR-TB early and taking the right precautions are crucial. The genotypic approaches have been found to be appropriate in the clinical situation and provide quicker results availability. In our study, 55.35% of patients had a favorable outcome; the WHO has reported an overall success rate of 46% in India.[17] Patients who lived in urban areas, had moderately advanced disease, had conventional treatment, and were diagnosed early had higher treatment success rates. Compared to LPA, which takes 72 hours to diagnose, patients diagnosed with the GeneXpert test have a relatively good treatment success rate because the report is ready in 90 minutes. In most low-income countries, which have the largest burden of MDR-TB, individualized treatment—which is recommended by a small number of physicians—is costly and challenging to administer. As a result, using standardized treatment plans for MDR-TB patients lowers the overall cost of therapy by five to ten times and decreases the number of medical facilities required.[18]

CONCLUSION

These findings suggest that the MDR-TB is prevalent in middle-aged men who have a history of diabetes, COPD, alcoholism, or smoking. The success rate varies and is mostly dependent on early discovery and careful monitoring. Standard treatment can lower morbidities and mortality.

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