

# Research in Pharmacy and Health Sciences

## Research Article

### A Clinical Study on Prevalence of Multi Drug Resistant Tuberculosis in Khammam District, Telangana – An Observational Study

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#### ABSTRACT

**Background:** The aim of the study is to evaluate the prevalence of multi drug resistant tuberculosis in Khammam district. The objective is to create awareness among healthcare personnel and patients regarding MDR-TB. The study was conducted over a period of six months, i.e., December 2016 – June 2017. **Result:** A total of 54 MDR-TB cases were studied. According to age groups 32 subjects are in the young and middle age groups which comprise a total of about 59.1 whereas in early age there are 6.8%. Many variables are considered in this study out of which alcohol was rated as highest because 59.2% subjects in the study were alcoholics. A total of 31.8% smokers was found out. Diabetes was also a variation with 27.8% subjects suffering. A total of 18.5% of subjects was suffering from TB with HIV. **Conclusion:** The study reveals that the subjects suffered from resistance to category-I drugs and hence they are transferred to category-IV drugs. Tuberculosis is a disease that mainly affects the people of age groups 20-40 and is more prevalent in males than that of females. Variables like alcohol consumption rated as highest risk factor, followed by smoking, diabetes and HIV respectively.

**Keywords:** MDR, Alcohol, Smoking, HIV, Diabetes.

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## INTRODUCTION

Tuberculosis (TB) is a bacterial disease which is caused by *Mycobacterium tuberculosis* in humans [1]. Rod shaped bacterium that mostly spreads through air-borne droplets of dried sputum. The prevalence of MDR-TB is increasing throughout the world both among new tuberculosis cases as well as among previously-treated ones. Although previous treatment for TB is the strongest risk factor for development of MDR-TB, treatment-naïve patients are also at risk due to either spontaneous mutations or transmission of resistant strains. The risk of transmission of resistant strains from close contacts is increasing day-by-day because of the growing burden of MDR-TB patients [2].

The World Health Organization reports that TB infects one new person every second and is the world's leading infectious cause of death next to HIV. Drug resistance is a major cause for increasing the global burden of Tuberculosis (TB) [3]. Resistance to isoniazid was the most common resistance observed, and HRSE (H: isoniazid; R: rifampicin; S: streptomycin; E: ethambutol)

was the most common form for MDR among both new and old treatment cases [4]. The program needs to urgently address these challenges for effective delivery and utilization of the MDR-TB services [5].

The aim of the study is to evaluate the prevalence of multidrug resistant tuberculosis in Khammam district. The objective is to create awareness among healthcare personnel and patients regarding multi drug resistant tuberculosis.

#### Methods:

**Study design, region, and period of study:** A cross-sectional epidemiological survey was conducted in the Khammam district of Telangana state. The study is conducted for over 6 months period i.e., from December 2016 to June 2017.

**Sample size:** A total of 500 cases were collected from Khammam region to be considered for this study. Each participant was taken into consideration individually.

**Materials and methods:** Questionnaires forms were used to levy various parameters. Sputum investigation and chest X-rays were done to confirm the disease in these patients [6]. The variables studied in this study include age, sex, HIV, diabetes, smoking and alcoholic consumption [7]. Individuals were classified as symptomatic if they had a cough for over 2 weeks, weakness, chest pain, and fever for over 1 month or hemoptosis on any occasion over six months [8]. Gene expert is used in the detection of MDR-TB [9].

**Results:**

A total of 54 cases was covered in this cross-sectional study, out of which 41 were males and 13 were females which is shown in Table 1. Majority of people i.e., 32 subjects are in the younger and middle age groups (below 40years) which comprises a total of about 59.1% where as in early age (<20years) and midst of 40-50 there are 16.6% (9 subjects) and 12.9% (7 subjects) respectively. A little lower is found in age groups of 50-60 and >60years which are 7.4% (4 subjects) and 3.7% (2 subjects) respectively as shown in Table 2, Figure1.

Table1: Distribution of MDR cases, according to sex

	Male	Female	Total
Number of MDR cases	41 (76.0%)	13 (24.0%)	54

Table 2: Distribution of MDR cases, according to age and sex

Age	<20		20-30		30-40		40-50	
Males	6	11.1%	13	24%	10	18.5%	7	12.9%
Females	3	5.5%	4	7.4%	5	9.2%	0	0
Total	9	16.6%	17	31.4%	15	27.7%	7	12.9%

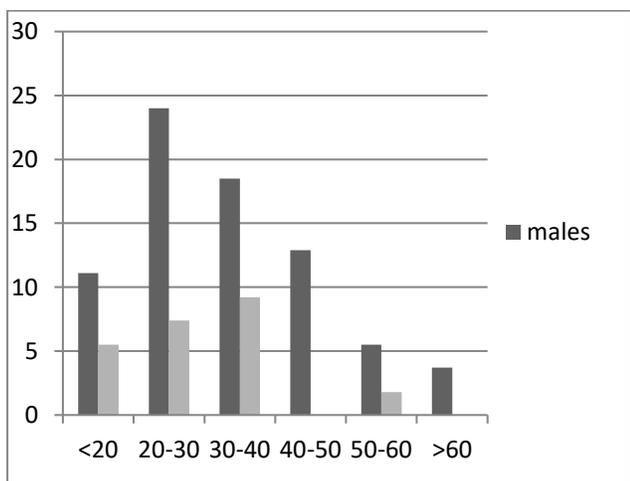


Figure1: Age and gender based representation of cases

Many variables are considered in this study out of which alcohol was rated as highest because 51.8% subjects in the study were alcoholics and all among them were men. Hence it is a major risk factor for multi drug resistant tuberculosis and also a total of 33.3% smokers was found

in men. Smoking and tobacco use shows a great deal of impact in MDR-TB according to previous surveys. In the survey, diabetes was also variable with 27.8% subjects suffering from diabetes with TB of them 24.1% are males and 3.7% are females. Subjects suffering with HIV have a risk of affecting with TB as they are immune compromised. In the study a total of 18.5% of subjects was suffering from TB with HIV. Out of them, 11.1% were males and 7.4% were females as shown in table 3, figure 2.

Table 3: Distribution of cases according to the variables

Variables	Male		Female		Total	
Alcoholic	28	51.8%	0	0	28	51.8%
Smoking	18	33.3%	0	0	18	33.3%
Diabetes	13	24.1%	2	3.7%	15	27.8%
HIV	6	11.1%	4	7.4%	10	18.5%

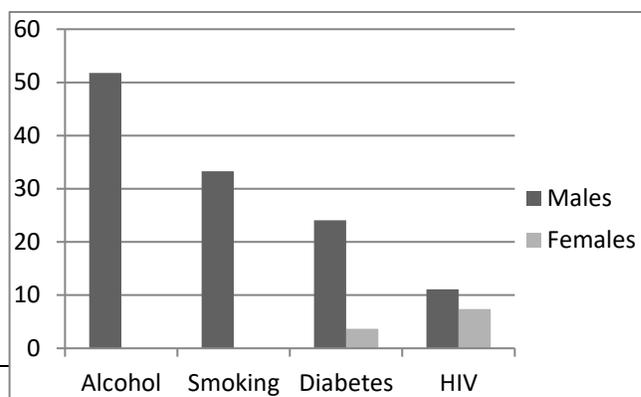


Figure 2: Graphical representation of cases according to variables

All the subjects tested for MDR-TB were resistant to category I drugs and so they were prescribed with Category IV drugs. Drugs that fall in each category are shown in table 4.

Table 4: Categories of drugs

Category-I	Category-IV
Isoniazid	Kanamycin
Rifampicin	Ethionamide
Ethambutol	Streptomycin
Pyrazinamide	Levofloxacin
-	Ethambutol
-	pyrazinamide
-	Cycloserine
-	pyridoxine

**Discussion:**

Despite a wide range of MDR-TB control strategies implemented by national and state boards TB is one of the leading cause of death from infectious diseases. Among the various variables studied in the study age and sex factors cannot be altered whereas HIV, diabetes can be monitored and cessation of alcohol, smoking are best

advised to decrease the risk of MDR-TB. In this survey majority of the affected subjects were males, which constitute about 76% of the total subjects and females of about 24%.

In this study alcohol were considered as an impact factor, because out of 54 cases 28 were alcoholics. In case of smoking the surveys prove that 18 subjects are smokers and is also a major risk in alleviation and development of MDR-TB. Even passive smoking was found to be a risk factor for the development of active pulmonary MDR-tuberculosis. Diabetes mellitus and smoking are risk factors for adverse outcomes in the treatment of MDR-tuberculosis (MDR-TB). Improved tuberculosis screening is urgently needed for human immunodeficiency virus (HIV) infected patients as they have the greatest chance of affecting with TB due to compromised immunity. Multi Resistant Drug resistance is due to poor adherence of subjects to category I drugs.

### Conclusion:

The increased risk of rifampicin resistance in patients with diabetes alarms the need for integrated diabetes surveillance in TB programs. The study reveals that MDR-TB is a disease that mainly affects the people of

age groups 20-40 and is more prevalent in males than that of females. Variables such as alcohol consumption and smoking play a major part in the occurrence of disease. Other variables concerned are diabetes and HIV. With regards to the growing number of diabetic cases even in children of age groups below 20 years with MDR-TB is a task to the government with both the causes leading to increased financial crisis for the country. By careful monitoring of diabetic levels and strengthening the immunity in case of HIV can reduce the risk of patients affecting with MDR-TB.

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### Abbreviations:

**HIV** - Human Immuno Virus

**TB** – Tuberculosis

**MDR-TB** – Multi Drug Resistant Tuberculosis

**DB** - Diabetes

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