

Frequency of Multidrug-Resistant Tuberculosis in Patients Visiting the Center of Tuberculosis at District Mirpur Khas, Sindh

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ABSTRACT

Background: Tuberculosis is a mycobacterial infection caused by mycobacterium tuberculosis bacillus. Antituberculous drugs are drugs used to treat tuberculosis which include first line anti-tuberculosis drugs used to treat tuberculosis initially when the infection is non-resistant these include Isoniazid, Rifampicin, Pyrazinamide, Ethambutol. Second line anti-tuberculosis drugs which are used to treat resistant tuberculosis or when first line drugs are contraindicated these include Ethionamide, Capreomycin, ciprofloxacin etc. Multidrug-resistant tuberculosis is tuberculosis not responding to 2 first line antituberculosis drugs.

Aims: To determine the frequency of multidrug-resistant tuberculosis cases and to determine the difference between the two genders.

Study Design: Cross sectional study.

Place and Duration of Study: Tuberculosis Center Mirpur Khas from 1st February 2015 to 28th February 2017.

Methodology: Two hundred and six tuberculosis patients were evaluated for multidrug-resistant tuberculosis and non-MDR tuberculosis and information was obtained.

Results: Multidrug-resistant cases were 184 (89.32%) while non-MDR cases were 19 (10.68%) with a non-significant difference between the two genders at p-value 0.675. INH resistance was observed in 4 (1.94%) patients, Resistance against the Rifampicin was seen in 15 (7.28%) patients while other cases were of multi drug resistant tuberculosis.

Conclusion: Multidrug-resistant tuberculosis is highly prevalent in the region and there is non-significant association between MDR-tuberculosis and the sex of the patient.

Keywords: Multidrug-resistant (MDR) tuberculosis, Frequency, Gender

INTRODUCTION

Tuberculosis is an infectious disease with very old history. It is caused by mycobacterium tuberculosis bacillus. There are many associated risk factors like the disease is more common in low socio economic people with over crowding and poor hygiene and immune compromised patients. The disease involves almost every part of the body but classically divided as pulmonary tuberculosis and extra pulmonary tuberculosis this disease kills 1.3 million people annually in the world.¹

The treatment tuberculosis consists of an initial or intensive phase of two months with four drug combination (Isoniazid, Rifampicin, Ethambutol and Pyrazinamide) and a six month continuation phase with 2 drugs (Isoniazid and Rifampicin). Multi drug resistance is emerging as the mycobacteria develops resistance against these drugs such cases are known as multi-drug resistant (MDR) tuberculosis. Drugs used to treat Multi drug tuberculosis are known as 2nd line drugs which include (Ciprofloxacin, Amikacin, Cycloserine, ethionamide etc).

Multidrug-resistant tuberculosis kills approximately 110000 people annually and 50% new MDR cases are reported every year cause being the poor infection control.² Indian study shows 23.3% MDR tuberculosis among all tuberculosis.³ Multidrug-resistant cases are also reported to be highly prevalent in China, Iran, Afghanistan, Indonesia and Nigeria. An estimated 14000 cases of MDR/RR-TB

were reported in Pakistan in a global report of 2015 out of which 4.2% were new cases while 16% old tuberculosis treated patients.⁴ According to estimated data 110,000 patients die due multi drug resistant tuberculosis worldwide annually while 500000 new MDR tuberculosis cases are identified each year and 3% of which get proper treatment.⁵

There was no previous published literature found from Mirpur khas district of Sindh in search. The current study is planned to estimate the frequency and percentage of MDR tuberculosis cases presenting to Tuberculosis Center at Mirpur Khas Sindh. Mirpur Khas District belongs to interior Sindh specially the desert area is related to the peripheral rural area of this district with large number of cases of tuberculosis but there was lack of information about the frequency and percentage of MDR cases. This study will fill this knowledge gap.

MATERIALS AND METHODS

This cross sectional study was conducted at Tuberculosis Center Mirpur Khas Sindh. Patients on 2nd line antituberculosis drugs, relapse cases, all age groups and both male and female patients were included. The undiagnosed patients, patients on 1st line anti-tuberculosis drugs, Lower RTIs other than tuberculosis were excluded. The information required was obtained from the patient or attendant as feasible. Investigations available with the patient or the treatment center were used as a source of

information. The data was entered and analyzed through SPSS-24.

RESULTS

There were 105 (51%) females and 101 (49%) were males [Fig 1]. Multidrug-resistant cases were 184 (89.32%) while non-MDR cases were 19 (10.68%) [Fig. 2]. There was a non-significant difference observed between the two genders p-value 0.675 [Table 1]. INH resistance was observed in 4 (1.94%) patients, Resistance against the Rifampicin was seen in 15(7.28%) patients, Resistance for INH and Rifampicin was found in 32 (15.53%) patients, INH, Rifampicin and Ethambutol were resistant in 12 (5.83%) patients, whereas resistance against INH, Rifampicin and Pyrazenamamide together was seen in 15 (7.28%) cases, INH, Rifampicin and Streptomycin were found resistant in 17 (8.25%) patients. INH, Rifampicin, Ethambutol, Streptomycin were resistant in 23 (11.17%) patients, INH, Rifampicin, Pyrazenamamide, Streptomycin were resistant in 08(3.88%) patients, INH, Rifampicin, Ethambutol and Pyrazenamamide were resistant in 30(14.56%) patients (Table 2).

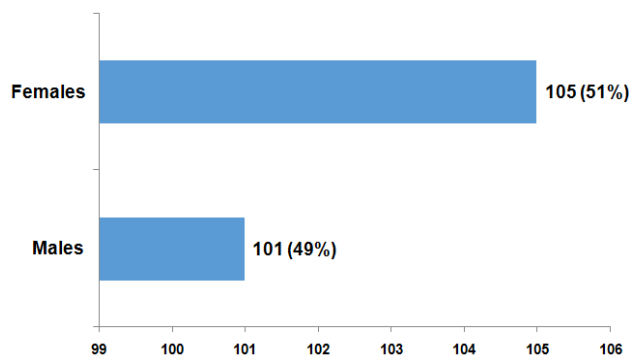


Fig.1: Frequency and percentage of gender

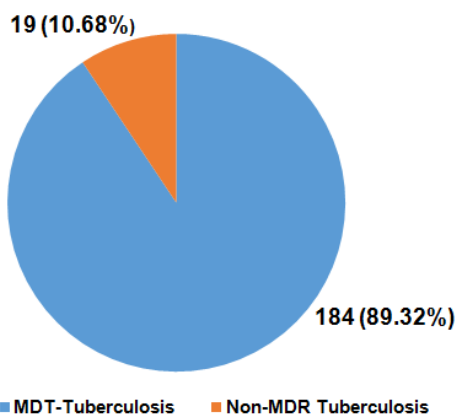


Fig.2: Frequency and percentage of MDR and non-MDR tuberculosis

Table 1: Gender based comparison between MDR and non-MDR cases (n=206)

Parameters	Males	Females	P value
MDR Tuberculosis	90	95	0.675
Non-MDR Tuberculosis	10	09	

Table 2: Frequency and percentage of various drugs (n=206)

Resistant drugs	No.	%
INH	4	1.9
Rifampicin	15	7.28
INH and Rifampicin	32	15.53
INH, Rifampicin and Ethambutol	12	5.83
INH, Rifampicin and Pyrazenamamide	15	7.28
INH, Rifampicin and Streptomycin	17	8.25
INH, Rifampicin, Ethambutol, Streptomycin	23	11.17
INH, Rifampicin, Pyrazenamamide, Streptomycin	08	3.88
INH, Rifampicin, Ethambutol, Pyrazenamamide	30	14.56
INH, Rifampicin, Ethambutol, Pyrazenamamide, Streptomycin	50	24.27

DISCUSSION

The multidrug-resistant tuberculosis surveillance data of 2017 by WHO revealed that there were 4.1% new MDR cases while 19% were old tuberculosis patients which were treated previously.⁶ Goyal et al³ from India reported the prevalence of MDR tuberculosis as 23.3% among the total tuberculosis cases (old and new). This is quite higher when compared to our study. This might be due to variation in patient group studied. Previous exposure to antituberculosis drugs is among the most common risk for MDR tuberculosis.⁷ An Indian study by Shivekar et al⁸ reported mono-resistance 2.5% and 11.4% for Rifampicin and Isoniazid respectively whereas MDR reported by them was 5.4%. A study by Qadeer et al⁹ on 1467 relative contacts of tuberculosis patients and found that 3.8% (56) were positive for tuberculosis out of which MDR was surprisingly reported to be 96% (54) patients while 4% (2) were 1st line susceptible tuberculosis.

A study by Javaid et al¹⁰ from Peshawar (Lady Reading Hospital), KPK, Pakistan reported that out of 610 contacts of MDR tuberculosis patient 17.4% were diagnosed as MDR tuberculosis and 4.2% were 1st line susceptible. The treatment success rates are reported to be 74.3% and 78.7% for MDR tuberculosis in KPK, Pakistan may be due to cool and healthy climate of this region.^{11,12} The impact of sex has been pointed out by some researcher for the MDR tuberculosis but we could not find an association between the sex and MDR that is inconsistent between the reported studies and our study results.^{13,14} Similarly the results by Liu et al¹⁵ from China also report a positive association between MDR-Tuberculosis and female gender that is inconsistent with our findings. Despite of the improvement in the management of MDR-TB, measures for the prevention of MDR-TB are still unsatisfactory that are required to focus more on awareness side.

CONCLUSION

Multidrug-resistant tuberculosis is highly prevalent in the region and there is non-significant association between MDR-tuberculosis and the sex of the patient.

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