

Determine the Frequency of Pre-Extensively Drug Resistant TB, Extensively Drug Resistant TB in Patients with Multi Drug Resistant TB

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ABSTRACT

Aim: To determine the frequency of pre-extensively drug resistant TB, extensively drug resistant TB in patients with Multi-drug resistant TB

Study Design: Retrospective/Observational

Place and Duration: Abbottabad International hospital from September 2019 to Feb 2020

Methods: Total 220 patients with both genders were enrolled in this study. Average age of patients was 18-60 years, with a BMI less than 30. Out of 220 patients, the ratio of males was 57% as compared to females. All patients were examined by using drug sensitivity testing. Pre-XDR showed high prevalence rate than that of XDR tuberculosis in patients with MDR. Patients detailed demographics were recorded after written consent. Data was analyzed by SPSS 24.0.

Results: Out of 220 patients mostly patients 128 (58.18%) were males while rest of the patients 91 (41.82%) were females. The mean age of the patients was 36.42±11.54 years with mean BMI 23.45±2.62. In multi-drug resistant TB, the occurrence of pre-XDR was in 75 (34.09%) patients while in XDR the prevalence rate was 12 (5.45%) in patients. All the patients of pre-XDR TB were resistant to fluoroquinolone while patients of XDR TB were resisted to amikacin, kanamycin, capreomycin and fluoroquinolone.

Conclusion: Patients admitted with MDR TB had high prevalence of pre-extensively drug resistant TB as compared to extensively drug resistant TB.

Keywords: Tuberculosis, Multi-Drug Resistant, Pre-extensively drug resistant, Extensively drug Resistant

INTRODUCTION

Tuberculosis is one of the world's leading infectious diseases, causing over two million deaths and 9 million new infections per year. Statistics from the World Health Organization (WHO) for 2013 showing an estimated 2.1 million cases of TB for India out of a worldwide 9-million occurrence. The TB prevalence figure is estimated to be 2.6 million for 2013 [1].

Anti TB injectable community (kanamycin and capreomycin) somemicine was withdrawn from the list of the recommended DR-TB drugs by 2018 update to the World Health Organization (WHO) and only amikacin (Am) and streptomycin (S) were retained [2]. These latter drugs have been put in the bottom (formerly group C of Group B). These drugs are only considered if the findings of the drug sensitiveness tests (DST) confirm susceptibility. S is to be treated only if AM cannot be employed and the phenotypical DST results confirm susceptibility (due to suspected or reported resistance or unavailability).

In 4 situations where TB control is weak, immune controls and even among HIV / AIDS or malnutrition are impaired, the incidence of TB increases rapidly [3]. In general, about 20% of the patients with tuberculosis default are estimated to have failed or failed to respond to therapy and develop MDR-TB [4-6]. Improper use of anti-TB medicines of the Second Line in MDR-TB patients can

contribute to resistance amplification and XDR-TB development [7].

The main purpose of this study is to determine the prevalence of pre-extensively drug resistant TB and extensively drug resistant TB in patients with multi-drug resistant tuberculosis.

MATERIALS AND METHODS

This prospective/observational study was conducted at Abbottabad International hospital, Abbottabad from September 2019 to Feb 2020. Total 220 patients of both genders with ages 18 to 60 years presented with drug resistant tuberculosis were enrolled in this study. Patients detailed demographics including age, sex, residence and body mass index were recorded after taking written consent. Ethiopia, drug resistance TB diagnosis has been carried out using GeneXpert MTB/RIF assay, genotypic and phenotypic drug susceptibility testing (DST)

Patients who had used the aminoglycoside for a month or more in the past six month prior to the start of study, patients with renal failure, patients who received concomitant administration of other ototoxic drugs, and uncooperative patients were excluded from this study.

Complete previous history of antituberculosis drugs was explored from the patients and all the samples underwent gene expert and then drug sensitivity testing

(DST) for 1st and 2ndline drugs. All the data was analyzed by SPSS 24.0. Mean±SD was done. Frequencies and percentages were recorded.

RESULTS

Out of 220 patients 128(58.18%) were male while 91(41.82%) were females with mean age 36.42±11.54 years. Mean BMI was 23.45±2.62 kg/m².

Table No 1: Baseline detail of all the patients

Characteristics	Frequency No.	%age
Mean age (Yrs)	36.42±11.54	-
Mean BMI (Kg/m)	23.45±2.62	-
Gender		
Male	128	58.18
Female	91	41.85

In multi-drug resistant TB, the frequency of pre-XDR was in 75(34.09%) patients while in XDR the prevalence rate was 12(5.45%) in patients. The 75 patients of pre-XDR tuberculosis showed resistant to fluoroquinolone(FQ) only but the XDR tuberculosis patients 12 showed resistant to other drugs i.e. 4 patients resisted to amikicin, 3 were resisted to Kanamycin and Fluoroquinolone, resistant to capreomycin and fluoroquinolone was 2, rest of 3 were resisted to Amikicin, Capreomycin and Fluoroquinolone.

Table 2: Frequency of different drug resistant tuberculosis patients

Variabes	Frequency No.	% age	Drug Resistance
MDR TB	133	60.45	-
Pre-XDR	75	34.09	fluoroquinolone(FQ)
XDR	12	5.45	amikicin(AM),kanamycin(KM),capreomycin (CM) and fluoroquinolone(FQ)
Total	220	100	-

DISCUSSION

The trend of drug resistance tuberculosis was observed in TB patients with MDR. The amikicin (AM), kanamycin (KM) and fluoroquinolone (FQ) drug sensitivity tests were performed. In this analysis, we concluded that the prevalence of XDR TB was 12 (5.45 percent) while 75 (34.09 percent) were observed for pre-XDR TB. The results of all pre-XDR patients were 32.2% and 3.4% in MDR TB patients in 2018, in the same way as the Muhammad Atiqul Manan and Sarmad Naqvi et al. research. The prevalence of pre XDR and XDR TB was found to be 39.5% and 2% respectively compared to this similarity of findings by NisarRao et al.[9].

In our sample, FQ resistance was 34.09 percent and similar to many other studies, reported as 10 percent, 13 percent, 24 percent, 35 per cent and more. In comparison to the survey results, most stviations reported a higher rate of pre-XDR TB in India (56 percent), China (34 percent), Pakistan (24 percent), Bangladesh (16 percent), Nigeria (17 percent) and South Africa (17 percent).[10-15]

Identification of pre-XDR TB patients will allow physicians to closely track these patients and to avoid the more difficult to cure and poor successful progression to

XDR-TB. For the patients with MDR TB, our community has observed a big problem with the market access and abuse of medicines like Levofloxacin, Moxifloxacin, Ofloxacin and Sparfloxacin. Fluoroquinolones have failed traditional 1st row anti tuberculosis care in patients suspected of being TB. In stocks, this should be hard to buy.

Controlling DR-TB depends on early resistance detection, adequate treatment, increased patient understanding of TB treatment, and the destruction of transmission chains. Therefore, future initiatives in these areas in terms of TB prevention, care and management should concentrate on improving health care facilities, increasing laboratory capability for early diagnosis and treatment and tracking people with TB symptoms.

CONCLUSION

The pre-extensive drug-resistant TB in patients admitted to MDR TB was strong in contrast with extensive drug-resistant TB. DR-TB control depends upon early detection of resistance, adequate therapy, improved awareness for TB treatment and the disruption of transmission cells. Counter-sales of anti-tuberculosis medicines, especially second-line medicines, must also be prohibited.

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