

Drug Resistant Tuberculosis in a Tertiary Care Hospital in 1 Year

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Abstract: *The emergence of resistance to the drug used to treat tuberculosis and particularly multidrug resistance TB (MDR-TB), has become a significant public health problem in a number of countries and obstacle to effective TB control. The present study tried to comprehend the prevalence of MDR TB in suspected MDR, pre XDR and XDR-TB cases and number of patients on Bedaquiline regimen in tertiary care centre, in department of pulmonary medicine, SDS TRC and RGICD, Bangalore. A retrospective observational study was done from April 2019 to march 2020 at department of pulmonary medicine. All sputum samples were examined for AFB direct microscopy, CBNAAT and subjected for MGIT culture and sensitivity for M. Tuberculosis. Patient were classified into 4 categories based on DST results as drug sensitive TB, MDR TB, pre XDR and XDR-TB. A total 350 patients of MDR suspects selected for study. Prevalence of MDR TB is high in retreatment cases around 60.02% than in new cases around 9.6%. Prevalence of MDR TB is 69.91%, XDR TB is 13.42%, Pre XDR is 10.67 %, Mono H resistance is 8.8% and 20.85% of patients were initiated on Bedaquiline regimen and 55.14% were on shorter regimen. The need for complete drug susceptibility testing is required and not relying solely on molecular techniques that will identify MDR only. Individualized drug regimens for these patients based on DST will help in curtailing transmission of resistant strains within the community.*

1. Introduction

Drug-resistant tuberculosis (DR-TB) as become a significant public health problem in number of countries and one of the major obstacles in effective tuberculosis control programme. Emergence of drug resistant tuberculosis (TB), particularly multi drug resistant tuberculosis (MDR-TB) has been an area of growing concern and is posing a threat to global efforts of TB control. Programmatic management of drug-resistant TB (PMDT) is being implemented in India in a phased manner since 2006. Latest Surveillance shows that 4.1% of new and 19% of previously treated TB cases in the world is estimated to have rifampicin or multidrug-resistant tuberculosis (MDR/RR-TB). India is one of the high tuberculosis burden countries in the world accounting for nearly 27% of the global incidence. According to the latest World Health Organization (WHO) global tuberculosis report released in 2020, India in harboring MDR-TB cases and there were 1,47,000 cases of MDR-TB from India in 2020[1]. An estimated 2.2% (95% CI: 1.9-2.6) of new cases and 15% (95% CI: 11-19) of retreatment cases in India have MDR-TB [1]. Mismanagement of MDR-TB with erratic use of second-line drugs may lead to development of XDRTB. Globally, 6.2% of all MDR cases are XDR-TB[1] with Ramachandran et al reporting 3.2% of XDR strains among the MDR isolates in a field study from Gujarat [2] The HIV-TB co-infection aptly described as the cursed duet [3] with WHO estimated 6.6% HIV prevalence in incident TB cases in India in 2020 while 13% prevalence was reported worldwide [1]. Patients with HIV-TB co-infection frequently have advanced HIV disease and are at an increased risk of death and new opportunistic infections.

Aims and objectives

- To determine the pattern of drug resistance in patients presented in SDS TRC and RGICD.

- To determine the number of cases who were receiving Shorter regimen and all oral longer regimen at the time of study.

2. Methodology

- Study type: Retrospective, Cross sectional study
- Study duration : 12 months
- Study Place: Department of Pulmonary medicine, SDS TRC and RGICD .
- Sample size: 350

Method:

Sputum smear, Culture and DST reports of all DR-TB suspects who attended OPD between April 2019 to March 2020, sputum reports were retrieved and recorded. Based on the DST reports patients were categorised into MDR-TB, MDR with additional Fluoroquinolone or second line injectable, XDR-TB, Treatment initiated in these cases was noted.

Inclusion criteria:

- Age > 18 yrs.
- DR TB suspects as per RNTCP guidelines.
- H/o previous TB with ATT and comorbidities.

Exclusion criteria:

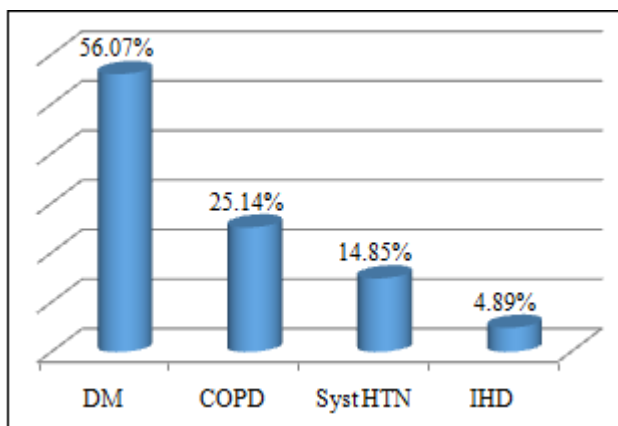
- Age < 18 yrs.
- Non Mycobacterium tuberculosis.

3. Results

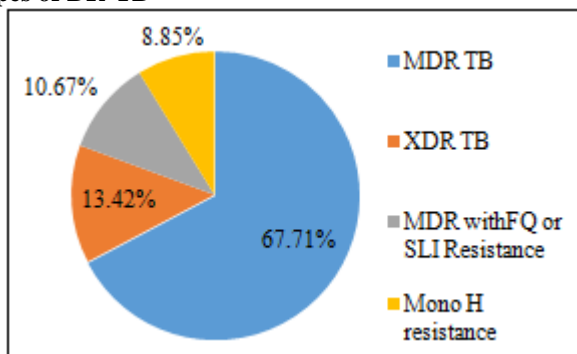
| Baseline Data | Number (%) |
|-----------------------------------|-----------------------------|
| Number of patients DR TB suspects | 350 |
| Age | 32 yrs (18.0-45.0) |
| Sex | Male: 247 (70.57%) |
| | Female: 103 (29.42%) |
| Area | Rural: 86% |
| | Urban: 14% |
| Site of involvement | Pulmonary : 305 (87.14%) |
| | Extrapulmonary: 45 (12.85%) |

| Baseline Data | Number (%) |
|--------------------------|-----------------------|
| Smokers | Male: 124 (35.42%) |
| | Female: 04 (1.14%) |
| Biomass exposure | Male: 11 (3.14%) |
| | Female: 68 (19.42%) |
| Body mass index (kg/m2) | 18.54 |
| HIV | Positive:127(36.28 %) |
| | Negative:223(63.71%) |
| Oxygen saturation: <90 % | 144 (41.27%) |
| | >90% |

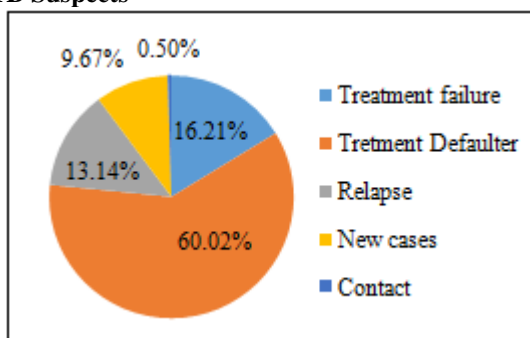
Co-morbidities



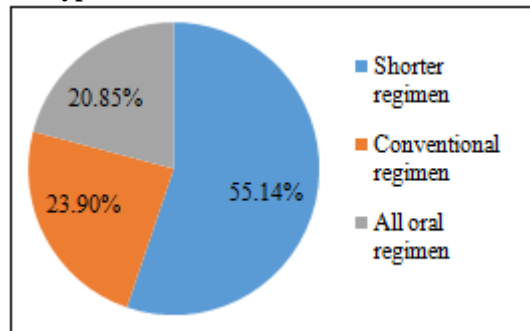
Types of DR-TB



DR-TB Suspects



Regimen types



| Baseline Data | Number (%) |
|---|----------------------|
| Total number of patients initiated on all oral longer regimen | 73(20.85%) |
| | Males: 51 (69.86%) |
| | Females: 22 (30.13%) |
| Total number MDR TB patients started on all oral longer regimen | 18 (24.66%) |
| Total number MDR with FQ or SLI patients started on all oral longer regimen | 36 (49.31%) |
| Total number XDR TB patients started on all oral longer regimen | 19 (26.03%) |
| Total number of patients completed IP phase and follow up culture was Negative. | 28 (38.35%) |

4. Results

- Out of 350 DR-TB suspects 69.91% of cases were found to be MDR TB among which 60.02% was secondary MDR and 9.6% was primary MDR TB.
- XDR TB was found in 13.42%, Pre XDR TB in 10.69% and Mono H resistance was noted in 8.8%.
- Among DR TB 55.14% were on shorter regimen and 20.85% were on all oral regimen.

5. Discussion

Treatment of MDR-TB often poses serious challenge to patients and majority of such patients are usually referred to tertiary care. In the present study majority of the MDRTB cases (67.78%) were in the younger age group (18-50 years); mean age was 32.52 years. In a retrospective study done in a TB unit in Mumbai, Dholakia and Shah noted that majority of the cases (67.6%) were in the age group 15-35 years with a mean age of 31 years [4, 5, 6]. Udwardia and Moharil, Sharma et al. also reported prevalence of younger age group among MDR-TB patients with the mean age of their study groups being 29.7 years and 33.25 years respectively [7,8]. Majority of our cases were male (70.57%). Male predominance among MDR-TB cases has been also reported by other authors [9,10]. Our patients were a heavily pre-treated group of MDR-TB patients of which majority belonged to default cases with (60.02%) Treatment failure (16.21%) Relapse (9.67%) had previous antituberculosis treatment. A recent meta-analysis also showed that relapse rate is high (almost 10%) in India and the risk factors for relapse included poor drug compliance, initial drug resistance, smoking, and alcoholism [11]. However, in a prospective study conducted by Sethi et al. in North India, major proportion of MDR-TB cases was due to treatment failure [12]. The mean BMI of the patients in this study was 18.54 kg/m2 (61.96%) were undernourished.

Malnutrition among MDR-TB cases was also reported from another study (mean BMI of 17.84 kg/m²) done in a tertiary care setting in New Delhi [9]. The commonest comorbidity among our study group (56.04%) was Diabetes followed by COPD (25.14%). Diabetes was present as a comorbid illness among 7.6% in a study carried out by Datta et al. And also found COPD to be the commonest comorbid disease among MDR-TB cases in a tertiary care hospital of Kashmir [9]. Globally, MDR-TB has been a particular concern among HIV infected persons, whose rate of survival is substantially lower than that of those not infected, and testing for HIV is recommended for all TB patients [3, 13, 14]. Very little data is available regarding HIV in MDR-TB in India with Datta et al. reporting 1.9% HIV seropositivity among MDR -TB cases [9]. However in the present study 36.28% MDR-TB patients found to be HIV seropositive. Majority of patients in our study had pulmonary TB (87.14%) and 12.85% had only EPTB. Similar findings have been reported by others [6]. In our studies 35.24% were smokers and 21.15% had biomass exposure. 41.27 % were hypoxemic on presentation. Majority of patients were started on shorter conventional regimen. 20.85 % started on all oral longer regimen in which 24.66% were MDR TB and 26.03% were XDR TB. 38.35 % had culture conversion.

6. Conclusion

Baseline DST is recommended for tailoring DR TB treatment. Optimum treatment will have an impact on treatment outcome.

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