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Drug Resistant Tuberculosis – Clinical profile and Resistance pattern in tertiary care teaching hospital.

Dr Chandrashekar[1], Dr Arun M[2], Dr Basavaraj Machnur[3], Dr Rohit Dixit*,

1- Assistant professor, 2,3-Associate professors, Department of General medicine – RIMS, Raichur,

***Professor, Department of pharmacology, SVS Medical College, Mahabubnagar**

ABSTRACT

Background: This drug resistant TB is a growing concern around the world. It accounts for huge financial and public health burden. Though drug resistant TB is not new to India but proper surveillance and treatment remains the mainstay in tackling this global problem. The primary objective was to study the clinical profile and drug resistance pattern of TB patients. The Secondary objective was to effectively diagnose and treat the DR TB.

Methodology: It was a cross sectional observational study conducted at department of General medicine at Raichur Institute of Medical Sciences (RIMS), Raichur. All the patients of Drug resistant tuberculosis (DR TB) who attended RIMS were included in the study. All the patients with drug resistance pattern were included in the study after taking their consent. Statistical analysis was done using SPSS Ver 21.

Results: A total of 552 TB cases were screened for drug resistance. Out of them 39 were found to drug resistant TB. The mean age of presentation in males was 39.92 years and in females it was 36.08 years. Patients who completed higher education and who were employed were more in number compared to others. All the classical symptoms of TB like cough with expectoration, fever, shortness of breath was seen in these patients. Among the 39 DR TB patients, 30 patients had previously suffered from TB. Out of these 30 patients, 18 (60%) were defaulters, 7 (23%) were irregular and 4 (14%) were treatment failure. Thirty two (82.05%) patient showed resistance to either Rifampicin or INH and remaining 7 (17.95%) patients showed resistance to both rifampicin and INH.

Conclusion: Drug resistance was predominantly mono resistance to either rifampicin or INH but MDR TB were also seen. Patients were educated regarding treatment compliance.

KEYWORDS: RNTCP, Programmatic Management of Drug Resistant Tuberculosis, Fever, Burden, Resistance

INTRODUCTION:

Tuberculosis is caused by mycobacterium tuberculosis and spread from person to person by air. It usually affects lungs but it can affect any part of the body, leading to morbidity and mortality. [1] Tuberculosis is one of the leading causes of deaths worldwide. In 2020 around 15 lakh people died from tuberculosis worldwide. An estimated 1.5 crore people fell ill with tuberculosis in 2020 alone worldwide. [2] India has the highest burden of tuberculosis worldwide. India has second highest burden of MDR TB globally after China. [3] Multidrug-resistant TB (MDR-TB) is a new threat for the treatment of tuberculosis and a major public health concern. Tubercle bacilli develops resistance to any of the first line drugs used in the treatment due to a genetic mutation when they are misused like taking incomplete treatment or wrong dosage and defaults the treatment etc. This drug resistant TB is spread the same way as tuberculosis spreads. [4] According to the latest estimates, a total of 1,24,000 (9.1/lakh population) cases of MDR/RR-TB are there in India. This drug resistant TB is a growing concern for the society. It accounts for huge financial and public health burden. Though drug resistant TB is not new to India but proper surveillance and treatment remains the mainstay in tackling this global problem. Early detection and treatment of DR-TB should be integrated into existing TB services.

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Central TB Division (CTD), GoI has prepared National Strategic Plan (NSP) 2017–25. It mainly focuses on management of drug resistant TB via strategies like prevent, detect, treat & build. According to this strategy early identification of presumptive TB & diagnosis by highly sensitive diagnostic tools for TB & DR-TB plays an important role in management of drug resistant TB. [5]

This study is a miniature attempt to study the clinical profile of drug resistant tuberculosis (DR TB) among patients visiting our hospital which may help reduce the morbidity and mortality of DR TB. The objective of the study is to study the clinical profile of drug resistant tuberculosis in our hospital.

METHODOLOGY

This was a cross sectional observational study. The study was conducted at department of General medicine at Raichur Institute of Medical Sciences (RIMS), Raichur. All the patients of Drug resistant tuberculosis (DR TB) who attended RIMS were included in the study. The study was done between the period from September 2019 to April 2020. Inclusion criteria: All patients with drug resistant TB between 15 to 80 Years. Exclusion criteria: Patient with other severe comorbidities like cancers, MI, stroke, ESRD etc. The primary outcome of the study was to study the clinical profile of drug resistant tuberculosis. The Secondary objective was to effectively diagnose and treat the DR TB.

Ethics committee clearance was obtained before starting the study. The tuberculosis patients admitted as inpatients were subjected to thorough history taking regarding clinical features and treatment. Patients who satisfied the inclusion criteria were included in the study with their consent. They were examined in detail and the study proforma was filled. All the patients underwent HIV testing, chest x-ray imaging and sputum microscopy, CBNAAT. Statistical analysis: The obtained data was subjected for descriptive statistical analysis using SPSS version 21.

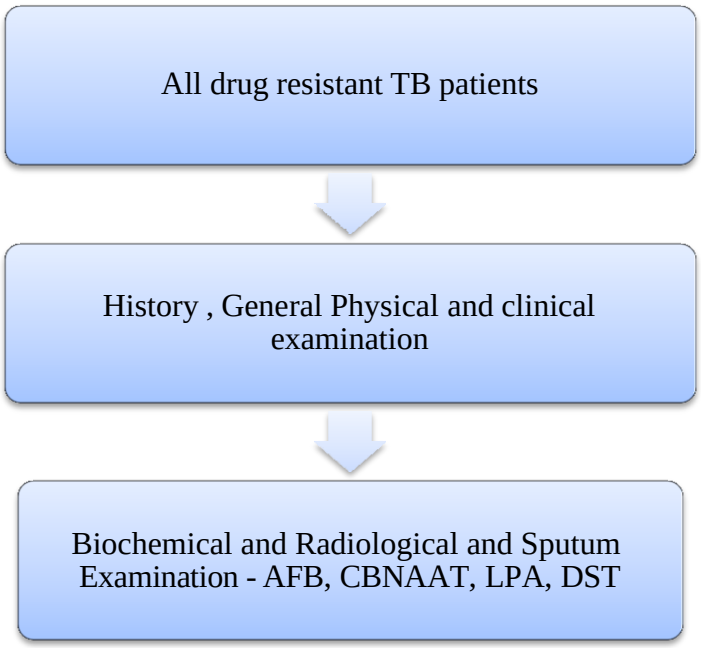

Figure 1: Schematic Drug resistant TB Diagnostic algorithm:

RESULTS

A total of 552 TB patients were screened for drug resistance. In this study, a total of 39 Drug resistant (DR-TB) patients were included.

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Sociodemographic details: The age of presentation of drug resistant tuberculosis was from 16 years to 70 years. According to the gender, the mean age of presentation in males was 39.92 years and in females it was 36.08 years. Among 39 patients, 25 (64.1%) were male and 14 (35.9%) were female. Out of 39 patients, 20 (51.28%) patients had BMI less than 18. Employment: Out of 39 DR-TB patients, 25 were employed, 12 were unemployed and 2 were students. Education: 20 patients completed high school, 16 completed only primary schooling and 3 never went to school. Annual income: 32 patients had annual income above 1 lakh while 7 patients had annual income below 1 lakh. Habits: Only males gave the history of smoking and alcohol consumption. Out of total 39 patients, 5 (12.9%) patients had history of smoking and 5 (12.9%) patients had history of consumption of alcohol. All the details are shown in table 1.

Table 1: Sociodemographic details

	Characteristics		Number of patients	Percentage (%)
1	Age	16-45 years	22	56.4
		46-60 Years	08	20.5
		60-70 Years	09	23.1
2	Sex	Males	25	64.1
		Females	14	35.9
3	BMI	<18	20	51.3
		>18	19	48.7
4	Occupation	Employed	25	64.1
		Unemployed	12	30.8
		Students	02	05.1
5	Education	High school	20	51.3
		Primary	16	41.0
		No school	03	07.7
6	Income	>1 Lakh	32	82.1
		<1 Lakh	07	17.9
7	Habits	Smoking	05	12.8
		Alcohol	05	12.8

Clinical findings: We examined all the 38 patients in detail and also obtained chest X rays. One patient was a fall out in our study, since he didn't turn up for examination and investigations. The most common presenting clinical feature was cough with breathlessness and followed by weight loss. All the symptoms are shown in graph 1. Other less common symptoms were fever, loss of appetite, fatigue, body pain etc. The chest X-ray revealed that 27 patients had consolidation/fibrosis and 11 patients had cavitations as shown in graph 2.

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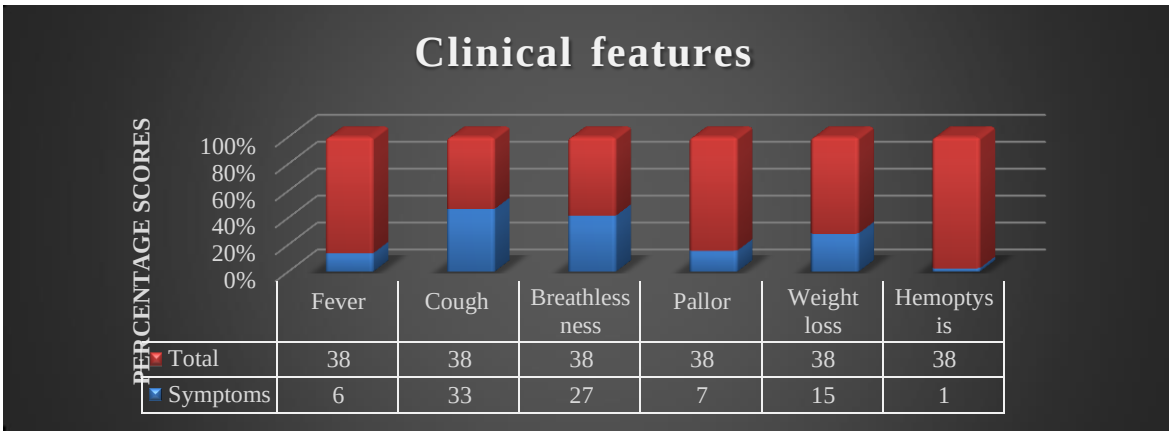
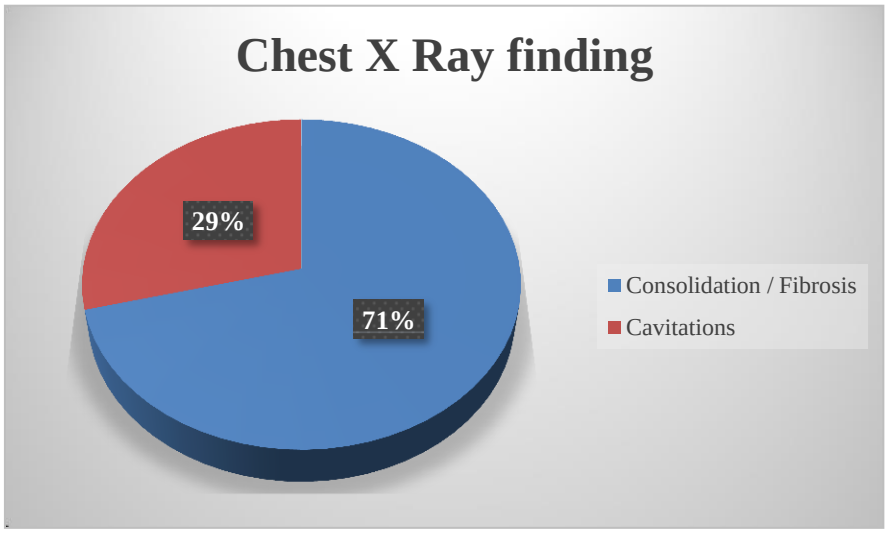
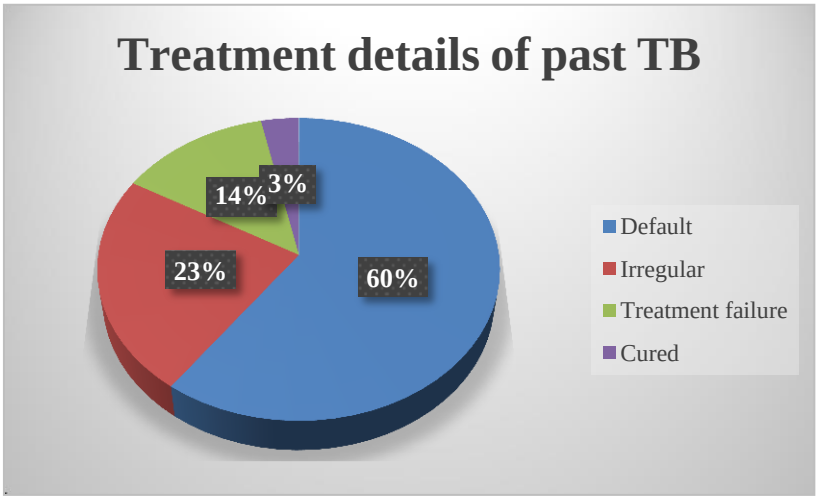


Graph 1: Clinical features of the DR-TB patients



Graph 2: X-Ray findings of the DR-TB patients

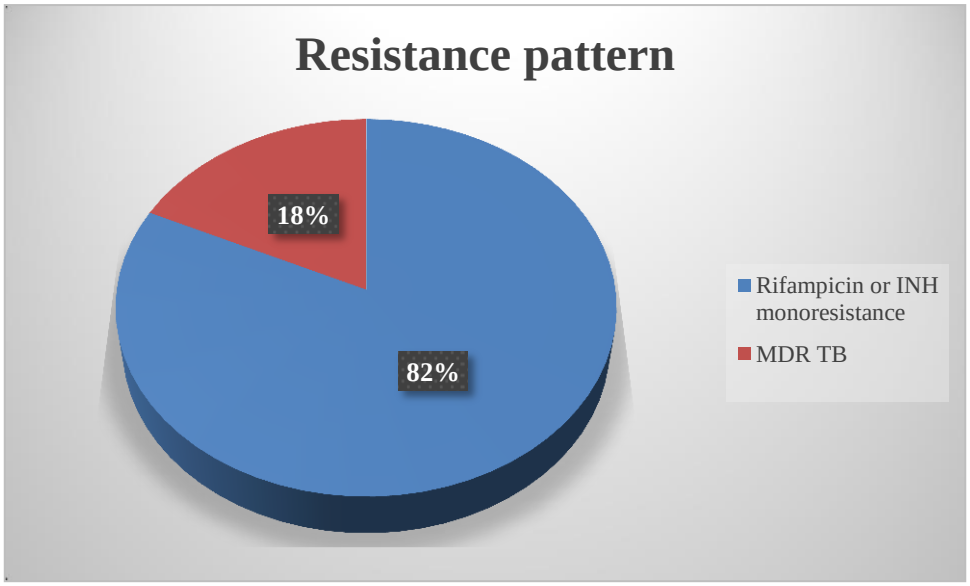
Previous history of tuberculosis: Out of 39 patients of DR TB, 30 (76.9%) patients gave a previous history of tuberculosis. Treatment details of past TB: Out of 30 patients of DR TB, 18 patients were defaulters, 7 patients were on irregular treatment, 4 patients were treatment failure and only 1 patient was declared as cured from the past TB. The details are as shown in graph 3.



Graph 3: Treatment details of past TB

Pattern of resistance: Among the 39 patients of Drug resistance TB, 32 (82.05%) patient showed

resistance to either Rifampicin or INH and remaining 7 (17.95%) patients showed resistance to both rifampicin and INH as shown in graph 4.



Graph 4: Pattern of Resistance to antitubercular drugs

DISCUSSION:

This study was undertaken to study the clinical profile of DR TB patients coming to RIMS, Raichur. In this study, the patients were analyzed based on their sociodemographic details including age, gender, BMI, Occupation, Education, Income and habits. The clinical features, past treatment history and the drug susceptibility was also studied in details.

Sociodemographic details: In our study of 39 patients, 25 were male and 14 were female. Out of the 16 DR patients 25(64%) were male and 14(36%) were females. The male: female ratio is 1.78:1. In the study by Sharma et al[6] the male to female ratio of the DR TB patients in a cat II pts. was 3.4:1. However in another study done by Dholakia N et al[7], the male to female ratio was 1:1. Hence there is a lot of variability but a slight male preponderance is obvious taking into the account the various studies including ours.

In the study done by Sharma et al[6] the mean age of DR TB patients was 33.25 ± 12.04 (18-55) yrs. whereas in our study it was 38 (16-70 years). The mean age group and the minimum and maximum age limits were found to be higher in our study population. In another study done by Dholakia et al[7], the majority of the cases were in the age group 15-35 years, mean age was 31 (range: 15-61 years).

Our study found that 21 patients were underweight. Literature suggests that underweight itself is an independent risk factor for failure of TB treatment. [8] May be if our sample size was more enough, we could have got similar BMI data in the patients.

Occupation and education of the patients getting treated plays an important role in the treatment of DR TB. Having low education or no education at all and migrating for jobs are few of the important factors which may result in stopping the TB treatment or irregular treatment. [9] Our study shows that, about 64% of patients were employed and 51% completed higher education. May be due to job change and other reasons patients defaulted the treatment of TB previously.

Smoking[10] is known risk factors for tuberculosis and studies have shown that there is about two-times increased risk of infection, progression to tuberculosis and death. Similarly, alcohol[11] consumption increases the risk to about three-times the risk of disease associated with consumption >40 g per day. In our study, only 5 patients gave the history of smoking and 5 patients history of alcohol consumption. However no clinically significant association could be found out as these were

not statistically significant.

Clinical features: The most common presenting features of TB or DR TB in patients is cough with expectorations, fever, shortness of breath and hemoptysis. [12,13 & 14] Our study also had the similar presentations but additionally weight loss was also seen in majority of patients.

Previous treatment history and resistance pattern: Improper treatment in the past, poor patient compliance due to various factors and poor prescribing practices remain the most important risk factors for acquired drug resistance. In our study, among the DR TB patients, 30 patients had previously suffered from TB. Out of these 30 patients, 18 (60%) were defaulters, 7 (23%) were irregular and 4 (14%) were treatment failure. Though not statistically significant, undoubtedly defaulters were found to have more DR TB. The greater number of defaulters in the TB group in our study may not be statistically significant but it points toward the importance of patient education and motivation regarding treatment compliance.

Our study showed MDR pattern in 7 patients (18%) and mono resistance to rifampicin or INH in 32 patients (82%). Previous studies by shivekar et al also report mono resistances and MDR TB pattern in their patients.

CONCLUSION

Patients presented with all the classical features of TB like cough with expectoration, fever, shortness of breath. Other features like hemoptysis and weight loss were also seen. Drug resistance was predominantly mono resistance to either rifampicin or INH but MDR TB were also seen. Patients were educated regarding treatment compliance. Diagnosis of DR-TB, if done at an earlier stage; will minimize the burden of DR TB in India.

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