SOCIO CLINICAL PROFILE OF MDR TB CASES: A STUDY AT DR –TB CENTER, SCB MEDICAL COLLEGE & HOSPITAL, CUTTACK, ODISHA.

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Abstract-

Introduction

India accounts for about one-fourth of the global burden of MDR-TB. This study aims to evaluate clinical profile and factors associated with tuberculosis drug resistance among patients from eastern India.

Method

All the MDR-TB cases registered under RNTCP PMDT services were included in the study between 1st April-2013 to 31st March 2014. This observational study was carried out by the Department of Pulmonary Medicine, SCB Medical College, Cuttack.

Result

Between April 2013 and March 2014, the IRL ATDC Center collected a total of 2205 sputum samples. Out of 2205, 245 (11%) had both INH and Rifampicin, 68 (3%), INH resistance, 359 (16.3%), and 51 (2.3%) had sputum contaminated with report awaiting. Mean age MDR TB was 35.6 (Standard deviation 13.769). The study shows 14.3% of the TB patients were illiterate. Out of 126 case of MDR-TB presented with 140 co- morbidities at DR-TB Center.

Discussion

High rate of drug resistance pattern was found among the new sputum smear positive pulmonary tuberculosis patients and also high MDR tuberculosis. Risk factors such as age, sex, smoking,

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and alcoholism were independently associated with pulmonary MDR-TB. Our study concluded that young age, male sex, smear positivity, treatment failure, and the combination of smoking and alcoholism were identified as risk factors for Tuberculosis mortality

Keywords: TB, MDR-TB, Drug-resistant, Odisha.

Introduction:

The most common infectious disease caused by Mycobacterium tuberculosis is tuberculosis.[1] In 2018, approximately 10 million people become infected worldwide.[1,2] The World Health Organization estimates that India accounts for 27% of all TB cases worldwide.[1,2] In addition, India is responsible for 27% of the global burden of rifampicin-resistant TB. In India, those between the ages of 15 and 24 have the highest TB incidence rates.[1] Men, women, and children experienced incidence rates of 60%, 34%, and 6%, respectively. In India and other South-East Asian nations like Vietnam and Myanmar, TB incidence and mortality are on the decline. However, the End TB programme is seriously threatened by multi-drug resistant tuberculosis (MDR-TB), which is resistant to first-line anti-TB medications such as rifampicin and isoniazid. [2]The prevalence of MDR-TB is 3.4 percent in new cases and 18 percent in individuals that have already received treatment globally. Rifampicin-resistant tuberculosis (RR-TB) patients were multidrug-resistant in 78 percent of cases worldwide.[3] According to a government survey conducted in India between 2014 and 2016, the prevalence of MDR-TB was 2.84 percent for new cases and 11.6 percent for patients who had already received treatment. Additionally, there was little evidence of rifampicin mono-resistance, and INH resistance was typically linked to rifampicin resistance. INH mono-resistance affects 7.2% of new cases of TB globally and 11.6% of patients of TB that have already received treatment. INH mono-resistance was found in 3.8% of newly diagnosed patients and 7.8% of cases that had already been treated in India. Numerous TB medication resistance studies use tiny sample sizes, hence the findings might not generalise to a larger population. In this study, which examined more than 20,000 sputum-positive and positive culture specimens, the temporal profile of TB medication resistance in the southern Indian states from 2013 to 2018 was revealed. Age, gender, prior treatment success or failure, HIV status, and drug resistance were all studied in relation to one another. MDR-TB treatment has a lower success rate—only approximately 56%—and requires toxic and pricey medications.[4,5] Therefore, it is essential to determine the prevalence and distribution of MDR-TB as well as other characteristics related to drug resistance in order to develop interventions, preventive measures, and treatments as well as to monitor their effectiveness.

Objective:

The aim of this study was to study the clinical profile of all the diagnosed cases of drug-resistant tuberculosis (MDR-TB) and to assess the social risk factor presumed to be associated with them.

Methodology:

This observational study was carried in TB Unit, DR-TB Center under the Department of Pulmonary Medicine, SCB Medical College, Cuttack. All the MDR-TB cases registered under RNTCP PMDT services were included in the study between 1st April-2013 to 31st March 2014. Pre-treatment evaluation of all MDR TB case was done as per PMDT Committee guidelines. The culture positive Mycobacterium tuberculosis isolates were subjected to drug susceptibility testing (DST) for first line anti-tuberculosis drugs, and the MDR isolates further subjected to second line DST. The pre-treatment evaluation included : Detailed history (including screening for mental illness, drug/alcohol abuse etc.), Weight, Height, Complete Blood Count with platelets count, Blood sugar to screen for Diabetes Mellitus, Liver Function Tests, Blood Urea and S. Creatinine to assess the Kidney function, TSH levels to assess the thyroid function, Urine examination – Routine and Microscopic, Pregnancy test (for all women in the child bearing age group) and Chest X-Ray. MDR TB cases who were registered before 1st April-2013 and after 31st March 2014 were not included in this study. Patients who were admitted for follow-up culture and for management of adverse drug reactions (ADR) are excluded from the study. Institutional ethical approval was taken before the commencement of the study.

Result

Total of 2205 sputum samples were received to IRL ATDC Centre between April 2013-March 2014. Out of 2205, 245(11%) both INH & Rifampicin, 68(3%) Rifampicin, 359(16.3%) INH resistance & 51(2.3%) sputum contaminated with report pending. However only 126(51.4%) MDR TB cases got registered for treatment during the study period. The rest 119 (48.6%) cases who had come for evaluation did not turn up for registration at this DR- TB centre. The details have been provided in Table-1

Table- 1 Details of sputum samples collection and tested status		
Status of Sample (N-2205)	Frequency (n)	Percentage
Both INH and R-Resistance	245	12%
Only R-Resistance	68	3%
Only INH-Resistance	359	18%
INH and R – Sensitive	1255	64%
Contamination	51	3%

Among the 126 MDR TB cases admitted to DR-TB Center SCB Medical College, Cuttack , males 94(74.6%) were more apparently than females 32 (25.4%).

Table-2: Socio-demographic characteristics of MDR patients			
Characteristics		**Frequency**	**Percent**
Gender	Female	32	25.4
	Male	94	74.6
Age Group	<18 years	13	10.3
	18-40 years	77	61.1
	41-65 years	33	26.2
	>65 years	3	2.4
Marital status	Married	105	83.3
	Un married	21	16.7
Education	Illiterate	18	14.3
	Matriculate	28	22.2
	Primary school	30	23.8
	Higher Secondary Education	26	20.6
	Graduate	24	19
Occupations	Business	12	9.5
	Cultivators	22	17.5

	House wife	16	12.7
	Labours	56	44.4
	Students	18	14.3
	Service (Govt. and private)	2	1.6
History of TB	H/O of TB in family	12	9.50
	H/O MDR TB contact	8	6.34
Weight band (Kg)	26-45	1	0.8
	>70	1	0.8
	16-25	1	0.8
	26-45	73	57.9
	46-70	50	39.7
Total		126	100

Table 2 shows among the 126 MDR TB cases admitted to DR-TB Center SCB Medical College, Cuttack, males 94 (74.6%) were more apparently than females 32 (25.4%). About 100 (87.3%) of TB patients were in the 18 to 65 years of age group, which is known to be the most economically productive period of life. Mean age MDR TB is 35.6 (Median age-34 with Standard deviation 13.769). The study shows 14.3% of the TB patients were illiterate, 2 3% studied up to Primary, 20.6 % in higher secondary, 22.2% Matriculate and 19% were Graduate. Among 126 patients, almost 56 (44.4 %) of the MDR TB patients were daily wage labourers, 22 (17.5 %) Cultivators, 10 (7.9%) students, 16 (12.7%) were housewives, and 7 (5.6%) and 3 (2.6 %) were working in Government and private companies respectively. All 126 cases (100%) were presently unemployed since they were not able to carry out normal routine work due to TB disease. The study shows that 12 (9.5%) and 8 (6.34%) are associated with history of TB in family & MDR-TB contact respectively causing the MDR-TB in study subjects.

Table 3 shows that the resistance to the 1st line MDR-TB drugs were INH 126(100), Rifampicin 110(87.3%), streptomycin17 (13.5%) and 2nd line drug Ofloxacillin 7(5.6%), Kanamycin 3(2.4%) and Amikacin 6(4.8%) respectively.

Table 3 Resistance to the 1st line MDR-TB drugs						
MDR Drugs	**Female**	**Percentage**	**Male**	**Percentage**	**Total**	**Percentage**
Streptomycin	3	2.4	14	11.2	17	13.5
Rifampicin	31	24.6	79	62.7	110	87.3
INH	32	25.4	94	74.6	126	100
Oflox.	0	0	7	5.6	7	5.6
Kanamycin	0	0	3	2.4	3	2.4
Cm	0	0	2	1.6	2	1.6
Cs	0	0	1	0.8	1	0.8
AMK	0	0	6	4.8	6	4.8

Out of 126 case of MDR-TB presented with 140 co- morbidities at DR-TB Center. DM and HIV alone contributed 57(45.2%) & 18(14.2%) respectively. In 13 cases the persons also suffered from Chronic Kidney Disease. Hepatitis B infection was also present in 14 persons and 11 cases had Hypothyroidism.

Discussion

TB is defined as tuberculosis resistant to at least isoniazid (H) and rifampicin (R). Inadequate drug treatment of an individual with TB will promote resistant organisms. A population resistant to a single drug then emerges, and continuing inadequate treatment goes on to have further drug resistance. A study by Gupta H et al highlights the high rate of drug resistance pattern among the new sputum smear positive pulmonary tuberculosis patients and also high MDR tuberculosis. A total of 185 patients were subjected to culture and drug sensitivity test & found that 21.3% were resistant to at least one drug.[6]

Male patients with tuberculosis were 67.6% and females were 32.4% in a study conducted by Chadha SL and Bhagi RP at the University of British Columbia (UBC) in Canada. Male patients with tuberculosis were 67.6% and females were 32.4% in a study conducted by Chadha SL and Bhagi RP at the University of British Columbia (UBC) in Canada.[6–10] The study is in line of our findings. Wobeser WL reported that marital status and loneliness are risk factors for active tuberculosis in people immigrating to Ontario, Canada. Those who were widowed or single were at a higher risk of developing MDR-TB (86) than those who were married or had been married

before moving to Ontario.[11] However present study does not show an association between marital status and MDR-TB treatment. All 126 cases (100%) were presently unemployed since they were not able to carry out normal routine work due to TB disease. A study conducted in China and by Ortiz JC et al showed that majority of the cases were engaged in agriculture. independently associated with pulmonary MDR-TB.[6,12–14] Kolappan C et al found in 93945 patients and concluded that risk factors such as age, sex, smoking, and alcoholism were independently associated with pulmonary MDR-TB. In another study conducted by Kolappan C et al studied the mortality of Tuberculosis patients and concluded that young age, male sex, smear positivity, treatment failure, and the combination of smoking and alcoholism were identified as risk factors for Tuberculosis mortality.[15,16] India has the highest rate of MTB and MDR-TB in the world. Three nations, notably India (27%) China (14%) and Russia (6%), account for nearly half of all MDR-TB patients worldwide (9 percent). There may be a surplus of pathways that allow for rifampicin resistance, as seen by the larger percentage of inferred resistance seen for Rifampicin compared with INH. The relationship between MDR-TB and age, gender, and HIV status points to the immune system's potential participation in the development of the MDR phenotype.

Conclusion

Counseling and involvement of community based organizations & Social support groups can have an definite impact on the success of treatment of MDR-TB .DR- TB Center located very close proximity of other Departments & Civilian pockets. Air exchange is open. Free access of patient's attendants & no use of personal protective equipment's & no free supply of sputum containers are great area of concern. Appropriate measures should be adopted for infection prevention.

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