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TO STUDY THE POSSIBLE PATIENT RELATED FACTORS CONTRIBUTING TO DRUG RESISTANCE for TUBERCULOSIS

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ABSTRACT

Background

The prolonged duration of treatment, the need for multiple drugs, adverse drug reactions and socioeconomic factors are the main reasons for non-adherence to treatment for tuberculosis which can lead to drug resistance, risk of transmission and death. Hence understanding the factors for drug resistance in TB patients is important.This study aims to assess the factors contributing to drugs resistance in tuberculosis patients.

METHODS

This cross sectional study was done on 198 drug resistance tuberculosis (DR-TB)patients at Department of Respiratory Medicine, Gandhi Medical College, Bhopal (MP). Patient diagnosed as drug resistant pulmonary TB were included

Results

In this study 71.7% study participants were male, majority were of age group 30-40yrs (36.4%) with BMI<18.5 (59.6%) and middle school qualified (37.9%). In this study non-compliance, adverse drug reaction and mental health issue (depression 37.3%,anxiety 24.4%, social stigma 26.6% & alcohol abuse 37.4%) on taking 1st line ATT(anti tubercular treatment) have statistical significance (p value<0.05) as possible factors leading to DR TB. Whereas unobserved treatment and socioeconomic factors do not have any significant correlation (p value >0.05)

CONCLUSION

This study concludes that above possible factors contributing to drug resistance should be taken care of in high risk group TB patients to avoid future risk of DRTB.

Keywords : Drug Resistance , Tuberculosis , MDRTB , Adverse drug reaction

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INTRODUCTION

The incidence of TB globally is 10 million out of which India contributes 2.64 million, around 26% of total burden[(2)]. DRTB has incidence of 0.5 million globally out of which India conceives 124,000 cases making it 27%[(3)]. Although, TB is curable, DRTB is more difficult to treat than drug susceptible TB because it requires the use of less effective second line anti TB drugs, which are also associated with major side effects[(3)]. DR TB is associated with a treatment duration of two to four fold in comparison to drug sensitive TB, psychological problems , economic problems and poor treatment adherence ,consequently leading to treatment failure[(4)]. It is also conventionally associated with higher case fatality rates (40-60%) [(5)]. Most of DRTB cases are due to poor adherence with TB medication, irregular use of drugs, interrupted drug supplies, physician error and accessibility of drug without prescription [(4)]. The prolonged duration of treatment, the need for multiple drugs, and socioeconomic factors are the main reasons for non-adherence to treatment[(5)]. This can lead to drug resistance, prolonged infectiousness, and death; hence understanding the determinants for drug resistance in TB patients is important[(6)]. Patient related factors like unobserved treatment, poor compliance, adverse drug reaction , socio economic burden and interruption in the treatment due to any mental health issues (depression, anxiety, false sense of improvement) in the middle of the course of the treatment play a significant role in development of drug resistance in TB patients[(7,9)].

This study aims to assess the patient related factors possibly contributing to drugs resistance pattern in tuberculosis patients . Also, with the aim of providing insight into the barriers to the ongoing programme for control of DR-TB and help in strengthening of the programme and the betterment of the patient.

OBJECTIVE

To study the possible patient related factors for development of drug resistance in tuberculosis patients.

METHODOLOGY

This is a Cross sectional observational Study conducted in Nodal DOTS plus site of Gandhi Medical College, Bhopal in the department of respiratory medicine from January 2020 to June 2021. Institute's Ethics Committee (IEC) clearance was taken and a written informed consent was obtained from all patients. During this study we took a total of 198 Patients with microbiologically confirmed DRTB. At baseline Patients perspective was assessed on the basis of the questionnaire pre designed .Those patients who were not giving consent & severely ill to answer questionnaire were excluded from study. SPSS software used for statistical analysis & data collection done using a preformed pro-forma.

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RESULTS

Majority of study participants comprised of male 142(71.7%) and female participants were 56 (28.3%). The Male: Female ratio was 2.5:1. High incidence of patients were seen in the age group of 30-40 years (median 36.4 years) i.e. 65 in numbers .Majority of patients belonged to lower socio-economic class(35.4%) & studied upto middle school (33.3%).

In our study (Table 1) we found that non compliance to drugs , adverse drug reaction and mental health issues (depression 37.3%,anxiety 24.4%, social stigma 26.6% & alcohol abuse 37.4%) were found statistically significant factors in the development of drug resistance in terms of patient related factors indicating that if these factors prevail than the chances are high for development of resistance. On the other hand factors like socio economic factors and unobserved treatment were found to be insignificant but these factors also indirectly play a significant role in development of resistance, so these factors also shouldn't be ignored .

Table 1: Association between patients related factors and DRTB

FACTORS / Resistance Pattern		**HR Resistance %**	**R Resistance %**	**MDR %**	**Pre XDR %**	**Pre XDR + SLI %**	**P value**
Non-Compliance		10.6	16.2	20.7		4.0	**<0.05**
		4.0	8.6	8.6		0.5	
Adverse Drug Reaction		9.6	18.7	16.2		3.5	**<0.05**
		5.1	6.1	12.1		1.0	

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Socio Economic Burden		5.6	5.6	7.6		1.5	**>0.05**
		9.1	19.2	20.7		3.0	
Mental Health Issues		8.6	16.2	18.7		2.5	**<0.05**
		6.1	8.6	9.6		2.0	
Unobserved Treatment		4.5	4.5	7.6		1.0	**>0.05**
		10.1	20.2	20.7		3.5	

*p-value <0.05 is statistically significant

DISCUSSION

DR-TB has a vast financial burden on patients due to the complex nature and long duration of treatment regimens. Treatment distance, inaccessibility, transportation costs, and fees incurred during hospitalisation were all socio-economic hurdles affecting patient care. Inability to pay for care-related expenditures was recognised by **Oga- Omenka et al. 2020[10]** as a barrier to DR-TB diagnosis and treatment [37]. During the initial intensive phase of therapy, there were also linked employment losses and production time losses [24,25]. **Thomas et al. 2013[11]** observed that interruption in the treatment due to any mental health issues (depression, anxiety, false sense of improvement) in the middle of the course of the treatment is also an important leading to default and poor compliance to treatment and finally leading to default in the treatment. **Charles et al 2022[12]** observed mental issues like depression (42%), social stigma 56.6% & alcohol abuse 17.4% showed significant correlation with default in the treatment of tuberculosis with ultimately lead to high chances for development drug resistance. In study by **Hirpa S et.al. 2013[7]** 48.5% cases were not observed by health worker while taking treatment. 60.5% patients did not take medicines at regular time. **Fikre A et.al. 2019[11]** 20.5% had adherence to treatment in intensive phase while 25.7% showed adherence in continuation phase. Side effects of any kind if severe made the patient to stop the treatment and lead to default and development of drug resistance , in cases of mild and moderate side effects very few patients consulted the doctor.

Rajendra Prasad et al 2019[8] reported GI side effects as 12.5% , hepato- toxicity as 11.5% , peripheral neuropathy 5.04% , cutaneous adverse reaction as 1.5% and psychotic side effects as 0.9% , these ADR showed significant correlation with determinants to default treatment. In study by **Afshari M et.al. 2018[9]** 31.8% had history of adverse drug reaction that showed significant correlation as determinant for DR TB development **Hirpa S et.al. 2013[8]** 36.6% had encountered vomiting as most common drug side effect while patients who encountered any kind of side effects were about 50%. This also showed significant correlation as determinant for DR TB development.

In our study non-compliance to ATT drug intake on previous treatment, adverse drug reaction on treatment and mental health issues (depression 37.3%,anxiety 24.4%, social stigma 26.6% & alcohol abuse 37.4%) on previous treatment have statistically significant positive association suggesting that, with the ascent of these factors, incidence of DRTB may also increase. (p value <0.05). Whereas unobserved treatment and socioeconomic burden do not have any significant correlation (p value >0.05) but still they may play a signifiant role in development of MDR TB.

CONCLUSION

Factors like non compliance to drugs , adverse drug reaction and mental health issues (depression 37.3%,anxiety 24.4%, social stigma 26.6% & alcohol abuse 37.4%) had a strong correlation with development of drug resistance . Therefore

patients should be counselled well before initiating the treatment for TB and special attention be given to DRTB patients in further course of treatment. These steps would help in reduction of cases of DRTB and overall betterment of the patient and building up a healthy society .

References:

1. Chakraborty AK. Epidemiology of tuberculosis: current status in India. Indian J Med Res. 2004 Oct;120(4):248-76. PMID: 15520481.

2. Udwadia ZF, Mehra C. Tuberculosis in India. BMJ. 2015 Mar 23;350:h1080. doi: 10.1136/ bmj.h1080. PMID: 25805828.

3. World Health Organisation. Global Tuberculosis Report 2017 [WHO/HTM/TB/2017.23]. Available from: http://apps.who.int/iris/bitstream/10665/259366/1/9789241565516 eng.pdf. Geneva: World Health Organization; 2017.
4. Satyanarayana S, Nair SA, Chadha SS, Shivashankar R, Sharma G, Yadav S, et al. (2011) From Where Are Tuberculosis Patients Accessing Treatment in India? Results from a Cross-SectionalCommunity Based Survey of 30 Districts. PLOS ONE 6(9): e24160. https://doi.org/10.1371/journal.pone.0024160 https://doi.org/10.1371 journal.pone.0024160 PMID: 21912669
5. Central TB Division, Directorate General of Health Services. TB India 2014ĐRNTCP Annual Status Report. 2014:http://www.tbcindia.gov.in/showfile.php?lid=3142
6. Global Tuberculosis Report 2016. Geneva: World Health Organization; 2016 (www.who.int/tb/publications/global_report, accessed 19 December 2017).
7. Seung KJ, Keshavjee S, Rich ML. Multidrug-Resistant Tuberculosis and Extensively Drug-Resistant Tuberculosis. Cold Spring Harb Perspect Med. 2015 Apr 27;5(9):a017863. doi: 10.1101/cshperspect.a017863. PMID: 25918181; PMCID: PMC4561400.
8. Hirpa S, Medhin G, Girma B, Melese M, Mekonen A, Suarez P, Ameni G. Determinants of multidrug-resistant tuberculosis in patients who underwent first-line treatment in Addis Ababa: a case control study. BMC Public Health. 2013 Aug 28;13:782. doi: 10.1186/1471-2458-13-782. PMID: 23981845; PMCID: PMC4015150.
9. Afshari M, Aarabi M, Parsaee M, Nezammahalleh A, Moosazadeh M, Determinant factors of drug resistant tuberculosis in Iran, a case control study, *Clinical Epidemiology and Global Health* (2018), doi:https://doi.org/10.1016/j.cegh.2018.09.006
10. Oga-Omenka C, Tseja-Akinrin A, Sen P, Mac-Seing M, Agbaje A,Menzies D, Zarowsky C. Factors influencing diagnosis and treatment initiation for multidrug-resistant/ rifampicin-resistant tuberculosis insix sub-Saharan African countries: a mixed-methods systematic review. BMJ Glob Health. 2020 Jul;5(7):e002280. doi:10.1136/ bmjgh-2019-002280. PMID: 32616481; PMCID: PMC7333807.
11. The strategy that will fix health [Internet]. 2013 Oct 1 [cited 2021 Nov 22]; Availablefrom:https://hbr.org/2013/10/the-strategy-that-will-fix-health-care
12. Agbeko CK, Mallah MA, He B, Liu Q, Song H, Wang J. Mental Health Status and Its Impact on TB Treatment and Its Outcomes: A Scoping Literature Review. Front Public Health. 2022 May 31;10:855515. doi: 10.3389/fpubh.2022.855515. PMID: 35712316; PMCID: PMC9194388.