Socio Demographic Profile of Rifampicin Resistant Patient in Surat City

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ABSTRACT

Introduction: Drug resistance tuberculosis poses a major hindrance in effective control of tuberculosis. This study aims to assess the relationship of certain socio-demographic factors and Rifampicin resistant tuberculosis.

Settings and Design: It was a case control study which included 33 cases and 66 controls who had been registered in Revised National Tuberculosis Control Programme (RNTCP) and tested for Rifampicin resistance using CBNAAT test .Patient having resistance to rifampicin identified by CBNAA Test were considered as cases whereas patient sensitive to rifampicin identified by CBNAA Test were considered to be controls

Method: The study was conducted by pretested semi-structured questionnaire. . Information was gathered from the patients by taking interview.

Results: Rifampicin resistant tuberculosis was more in male (51.5%) than female (48.5%). Maximum number of cases was observed in age group 20-40 years. 51.5 % of the cases were illiterate. 33.33% cases were unmarried whereas 66.7% were married. 84.8 of the cases were Hindus. 81.8% of the cases were non- migrants as compared to 59.1% controls .According to modified Prasad's classification (AICPI index Surat (262) nov-2004) it was observed that maximum cases were from class IV and maximum controls were from class III.

Conclusions: Rifampicin resistance was higher among males and non- migrants significantly. Further explorations in these areas are required to effectively control the disease.

Key words: tuberculosis, rifampicin resistant tuberculosis, socio-demographic variables

INTRODUCTION

Spread of drug resistance of Mycobacterium tuberculosis strains to the anti-TB drugs is one of the major factors that sustain the current global TB epidemic including India. Spread of drug resistance could lead to a disastrous condition as drug resistant tuberculosis is not only difficult to treat both in terms of increased duration and number of medicines but also associated with unfavorable outcome.[1]

Rifampicin resistance is the resistance to rifampicin, detected using phenotypic or genotypic methods, with or without resistance to other anti-TB drugs. It includes any resistance to rifampicin, whether mono resistance, multidrug resistance, poly drug resistance or extensive drug resistance.

Rifamycins (rifampicin in particular) are one of the important pillars of short-course chemotherapy regimens for tuberculosis. Without rifampicin ,18 to 20 months of therapy is necessary to treat active disease.[2] It is therefore considered to be one of the most

important first line anti-tuberculosis drug and is a key factor in determining the effectiveness of the treatment regimens.[3, 4] As more than 90% of rifampicin –resistant strain are also resistant to Isoniazid, Rifampicin resistance can also be used as a valuable surrogate marker for MDR TB.[5,6] Emergence of rifampicin resistance is therefore a dangerous trend because it will eventually lead to Isoniazid resistance also , which will hamper the treatment and complicate the effort to control the spread of the disease.

The present study was conducted to identify the socio-demographic variables associated with Rifampicin resistance in pulmonary TB patients in local context which will help us in identifying high risk patients during early phase of first line treatment. It also enables us to gain an insight into the local scenario of drug resistant tuberculosis which is vital for control of TB.

AIMS AND OBJECTIVES

To find out the socio-demographic related factors associated with the phenomenon of rifampicin resistance among the patients of pulmonary tuberculosis in Surat city.

MATERIALS AND METHODS

Study Type: The study "Socio demographic profile of rifampicin resistant patient in Surat city" was a case control study of TB patients who had been registered in Revised National Tuberculosis Control Programme (RNTCP) and tested for Rifampicin resistance using CBNAAT test.

Study Setting: This study was conducted in Surat Municipal Corporation area of Surat which is a rapidly growing and highly industrialized city of India. It is a major centre for textile and diamond polishing industries and these industries are manned mainly by migrant labourers. Based on the current recommendations of the RNTCP programme DOTS Cat I any follow up positive cases, before initiation of Cat II cases, HIV-TB cases and cases having contact of MDR case were tested for rifampicin resistance. Identified resistance cases were put on DOTS plus (Cat IV) treatment while sensitive cases are continue on Cat I / Cat II based on the guideline.

Study Period: The period of data collection was spread over six months duration after getting formal approval from the ethical committee. Data analysis was done for the next three months.

Definitions of Cases and Controls:

Case: Patient having pulmonary tuberculosis with resistance to rifampicin identified by CBNAA Test for drug susceptibility under RNTCP Programme.

Control: Patient having pulmonary tuberculosis sensitive to rifampicin identified by CBNAA Test for drug susceptibility under RNTCP Program me.

Sample size: The sample size was calculated using OpenEpi software. Considering history of previous episode of TB, 23% in control (sensitive cases) and 62% in cases (resistant cases); Two sided CI (1-alpha) – 99; Power of study 80% and cases control ratio 1:2, the calculated sample size is 90, 30 for cases and 60 for controls.

Selection of Subjects:

Selection of Cases: Pulmonary TB cases identified as rifampicin resistant by RNTCP in Surat city were included in the case group. All consecutive resistant cases were included in case group till desired sample size for case group was achieved.

Selection of Controls: Two consecutive Pulmonary TB cases detected as rifampicin sensitive after the selected single resistant case were included in control group.

In cases where the selected case or control was not willing to participate in study or was unavailable or physically and mentally unfit to give information, the next consecutive eligible patient was included in the study.

Study Tools: The study was conducted by pretested semi-structured questionnaire. Information regarding socio-demographic profile like age, gender, education, occupation and income of the patients were gathered from the patients by taking interview.. Interview was conducted either at SMC urban health centre or DOT centre according to feasibility. Household visit were done only in those cases where patient could not turn up at treatment centre .Socio-demographic profile were correlated with rifampicin-resistant/sensitive status

Data collection: During recruitment, information pertinent to the study was imparted to patients and a written consent for participation in the study was obtained from each of them. Furthermore, all patients were interviewed using the same precoded structured interview schedule. It included questions related to their socio-demographic profile, years of stay and information on their migration to Surat,

Inclusion Criteria: Pulmonary tuberculosis patients who had been registered in RNTCP and tested for rifampicin resistance by CBNAAT test in Surat city were included in the study. Those who were not willing or absent or unable to participate in the study were excluded from the study.

Ethical Issues: Owing to ethical considerations, strict confidentiality of data was maintained and permission was obtained from Institutional Ethical Committee (IEC) of SMIMER before conducting the study. The permission was also obtained from RNTCP.

Consent: Informed written consent was taken after persuading the participants about the possible benefits and implications of the study.

Confidentiality: An assurance was given to maintain strict confidentiality of their personal details and information related to the study.

Data analysis: Data management and analysis was done using Microsoft excel and Epi-info software. Double data entry procedure was adopted and digitized data were checked for completeness and consistency. The categorical variables were assessed using Pearson chi-square. Mantel Hanzel Odds Ratio (OR) and corresponding 95% Confidence Interval (CI) were calculated for dichotomous variables.

RESULTS

The present study is a case control study in which 33(33.3%) case and 66(66.7%) control were considered.

The table shown above depicts various variables and their relationship with cases and controls. Out of total 33 cases, 17 (51.5%) were males and 16(48.5%) were females. Out of 66 controls, 14 (21.2%) males and 52(78.8%) were females. As P –value is 0.002; there is an association between the gender and cases.

Maximum number of cases was observed in age group 20-40 years. In males 64.7% of total cases and in females 56.20% of cases were from this age group.

Table 1: Details of educational status of case and control.

Variables	Study Groups		P- value
	Case (%)	Control (%)	
Gender			
Male	17(51.5)	14(21.2)	0.002
Female	16(48.5)	52(78.8)	
Age			
10-20	8	16	0.3794
20-40	20	33	
40-60	5	12	
>60	0	5	
Marital Status			
Married	22(66.7)	44(66.7)	1
Unmarried	11(33.3)	22(33.3)	
Religion			
Hindu	28(84.8)	57(86.4)	0.838
Muslim	5(15.2)	9(13.6)	
Community			
Migrant	6(18.2)	27(40.9)	0.024
Non Migrant	27(81.8)	39(59.1)	
Education			
illiterate	17(51.5)	33(50)	0.887
literate	16(48.5)	33(50)	
S.E Status			
I	4(12.12)	2(3.03)	
II	11(33.33)	20(30.30)	
III	4(12.12)	23(34.84)	
IV	12(36.36)	14(21.21)	
V	2(6.06)	6(9.09)	

Out of total 99 subjects, the percentage of illiterate 17(51.5) was high in cases as compared to illiterate in controls 33(50) but it was not statistically significant.

66 (66.67) study subjects were married among then 22(66.7) were cases and 44(66.7) were controls. Out of total 33 unmarried 11 (33.33) were cases and 22(33.33) were controls.

28(84.8) cases were Hindu which was more as compared to others (Muslim) 5(15.2) but it was not statistically associated (P-value =0.838). Even in controls the maximum patients belong from religion Hindu 57(86.4) as compare to others (Muslim).

Cases had significantly higher number of non- migrants than controls. Out of the total 33 cases, 27(81.8%) were non - migrants as compared to 39 (59.1%) out of total 66 controls.

According to modified Prasad's classification (AICPI index Surat (262) nov-2004) it was observed that maximum cases were from class IV and maximum controls were from class III.

DISCUSSION

In our study there is an association in between the gender and case and control, and more males17 (51.5%) are in cases as compared to females i.e. 16(48.5%).As P –value is 0.002 so, there is a significant association between the gender and drug resistant TB. This also coincides with the epidemiological picture of tuberculosis where males are more exposed to infection in the community than females because of occupational and mental stress or other social factors which prevent females from seeking medical advice, which may cause a false lowering of the incidence rate in females. Similar results was seen in a study conducted by Faustini A et al.[7]whereas the opposite was found in other studies done by Lamaze N et al.2009[8] and Ejaj M et al.2010[9]. Gender did not appear to be a risk factor in study done by Mahfouz Rifat et al. [10]

Maximum number of cases and controls were observed in age group 20-40 years. Atre et al[11]. in their study also found nearly 69% patients belonged to the 15-35 years age group This might be due to increase of exposure to infection in active age group and the effect of physical and mental stress. Also as they are more burdened with responsibilities they tend to ignore their health and avoid or discontinue treatment.

Among cases, 22(66.7%) were married whereas 11(33.3%) were unmarried unlike a study done by Goswami A et al.[12]who reported unmarried people more likely to be suffering from drug resistance TB. Likewise in a study done by Atre en al. found out that fifty-six percent of the patients were married.

In assessment for religion wise distribution of case and control majority of the patients belong to Hindu religion. Out of total 33 cases 28(84.8%) cases were Hindu which was more as compared to others (Muslim) 5(15.2) but it is not statistically associated (P-value =0.838). Similar findings were found in other study.[13] No incidence of drug resistant TB was re-

ported from religion other than these two which is highly unlikely. Perhaps use of other health facility could be the reason for this.

In our study the percentage of illiterate subjects was 17(51.5) was high in cases as compared to illiterate subjects in controls 33(50) but it is not statistically significant. In a study by Gaude GS et al.[14] concluded that that illiteracy (P= 0.01), was statistically significant associated with the development of MDR. Vijay kumar et al[15] and Chadha SL[16] have indicated in their study literacy positively affects the diagnosis and treatment of TB patients and hence it also affects the prognosis of TB.

In this study the migrant community wise distribution of case and control was such that out of the total 33 cases, 27(81.8%) were non- migrants as compared to 39 (59.1%) out of total 66 controls and it is statistically significant (P-value -0.024). A study by Chen J et al. [17] considers that migration is one of the major challenges that hampers TB control in both developed and developing countries. Migration within a country is also common. It may be that different cultures and socioeconomic backgrounds from the local residents is the basic culprit. Migrants face increased risk of developing and transmitting diseases due to their limited access to housing, education and health care services and the economic hardships of illness and treatment as indicated by Kirwan DE, et al. [18] Previous studies showed that migrant TB patients often find it hard to get and find jobs facing financial pressures during their treatment (Wei XL et al. 2009)[19]. In a study by Caminero JA in France, non-permanent residents, urban migration for occupation, were discovered to be important and frequently found risk factors for MDR.[20]

By applying the modified Prasad`s classification according to AICPI index Surat (262) nov-20014,it was observed that maximum patients were from class IV in cases and in class III in controls .This is in link with most of the studies such as the study done by Gaude GS et al.[14] which summarized that illiteracy (P= 0.01), low socio-economic status (P= 0.008), manual labourers (P= 0.006), past history of PTB (P= 0.001) and alcoholism (P= 0.01) were statistically significant associated for the development of MDR. In fact all these factors are interdependent and presence of one factor leads to other factors.

CONCLUSION

The present study found among the various socio demographic variables gender male to be significantly associated with Rifampicin-resistant Pulmonary TB in Surat City. Surprisingly, number of cases of Rifampicin-resistant Pulmonary TB was significantly higher among non –migrant population as compared to migrant population. Migrants are a critical group in the battle against Drug resistant-TB, as they are at higher risk of contracting the strain of TB, but are many a times missed due to the gaps in the system. A large study covering a wider geographical area and bigger sample size is required to gain a better insight into this aspect of the problem.

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