Original Research Article

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Clinico-epidemiological profile and adherence to antitubercular treatment of tuberculosis patients in a city of Maharashtra

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ABSTRACT

Background: Poor patient adherence to the treatment regimen is a major cause of treatment failure and of the emergence of drug-resistant TB. Present study was conducted to study clinico-epidemiological profile and adherence to anti tubercular treatment among tuberculosis patients.

Methods: It was a cross sectional study done among 462 tuberculosis patients visiting G. G. Rathi Tuberculosis hospital during period January 2020 to April 2020.

Results: Out of total 462 study subjects 268 (58%) were male and 194 (42%) were female. Most of i.e. 143 (30.9%) were from age group 41-50 years. majority i.e. 148 (32.0%) were educated up to secondary school. As per Morisky medication adherence scale-4, majority 325 (70.4%) study subjects were having high adherence.

Conclusions: About 8% of the patients were having low adherent. Age and education of study subject was found to be significantly associated with adherence.

Keywords: Clinico-epidemiological profile, Morisky medication adherence scale-4, Tuberculosis

INTRODUCTION

Tuberculosis is one of the primary diseases of poverty. A third of the world's population is thought to be infected with *M. tuberculosis*, and new infections occur at a rate of about one per second. Tuberculosis is a major barrier to social and economic development. It is a disease of each and every age group and mostly earning males as well as a person who has poor immunity mostly elderly. It is a disease of poverty affecting mostly young adults in their most productive years. The vast majority of tuberculosis deaths are in the developing world. Left untreated, each person with active tuberculosis disease will infect average between 10 and 15 people every year and this continues the tuberculosis transmission.²

Tuberculosis is treatable with a course of antibiotics. Commonly Tuberculosis patients need to take anti Tuberculosis treatment for at least 6 to 8 months over a year, depending on severity of the disease which is

classified into different categories. Technically, the efficacy of anti-tuberculosis drugs is most reliable if taken under empty stomach. The patients need to take all the tablets at one time and regularly at the same time every day.3 Under DOTS program, one component of provision of anti-tuberculosis drugs to patients is the direct observation of patient taking the drugs. Generally Compliance is defined as: 'the extent to which the prescriber's patient's behaviour matches the recommendations'. And Adherence is defined as: 'the extent to which the patient's behaviour matches agreed recommendations from the prescriber'. Compliance with treatment duration, for tuberculosis, is the days of taking drugs, is a major indicator for the success of the treatment for TB control programme.4

Patients who do not complete their anti-tuberculosis treatment or who take irregularly on account of any reason are found to develop drug resistant tuberculosis, or relapse of the infection, that can lead to many

consequences. Also there is tendency that patients who do not complete treatment may continue to infect others in the community as well as developing a relapse of tuberculosis.⁵

The aims of the 'Stop TB' and DOTS strategy are to increase the tuberculosis treatment success rate from 60% to 85% for all smear positive pulmonary tuberculosis cases and to detect 70% of such cases. The ultimate goal of the 'Stop TB' and DOTS strategy is to encourage family members to actively support patients and enhance compliance to Tuberculosis treatment.⁶

Considering the above facts it was decided to study clinico-epidemiological profile and adherence to anti tubercular treatment of patients suffering from tuberculosis in a district tuberculosis hospital in Amravati city.

METHODS

It was a hospital based cross-sectional study, carried out in District Tuberculosis hospital, Amravati during January 2020 to April 2020. All diagnosed tuberculosis patients on anti-tubercular treatment coming to our hospital and giving consent to participate in study was included.

By using pre designed, semi structured questionnaire, face to face interview was conducted to collect information about socio demographic factors like age, sex, education, occupation, socioeconomic status etc. Adherence to anti TB drugs was evaluated using Morisky medication adherence scale-4. Duration of one month was considered to evaluate adherence. 462 study subjects were studied during the study period.

The collected data was entered in Microsoft Excel, and was analyzed by using SPSS (Statistical Package for Social Sciences) trial version 20.0 statistical software by maintaining anonymity and privacy of respondents. Ratio, proportion, and percentages was calculated. To find out the association between two variables chi square test was applied for qualitative data. The analyzed data is presented in the form of text and tables.

RESULTS

In present study total 462 study subjects were interviewed for clinico-epidemiological profile and adherence to anti tubercular treatment. Out of total 462 study subjects 268 (58%) were male and 194 (42%) were female. Most of i.e. 143 (30.9%) were from age group 41-50 years followed by 108 (23.4%) in age group 51-60 years. Very less i.e. 13 (2.8%) were less than 10 years of old. Among all, majority i.e. 312 (67.5%) were Hindu by religion followed by 68 (14.7%) Muslims and 6 (1.2%) were from other i.e. Jain and Christian religion. While considering the education of study subjects, majority i.e. 148 (32.0%) were educated up to secondary school. 101 (21.9%) study

subjects were illiterate. Very few i.e. 47 (10.2) were educated up to graduation and above. After applying Kuppuswami scale of occupation, it was found that majority i.e. 167 (36.1%) were unskilled worker, followed by 116 (25.1%) semiskilled worker.

Table 1: Distribution of study subjects according to socioeconomic status.

	Male	Female	Total
Variable	N (%)	N (%)	N (%)
Age in years	11 (70)	11 (70)	11 (70)
<10	6 (1.3)	7 (1.5)	13 (2.8)
11-20	18 (3.9)	10 (2.2)	28 (6.0)
21-30	25 (5.4)	18 (3.9)	43 (9.3)
31-40	71 (15.8)	32 (6.9)	103 (22.3)
41-50	89 (19.3)	54 (11.7)	143 (30.9)
51-60	49 (10.6)	59 (12.8)	108 (23.4)
>61	10 (2.2)	14 (3.0)	24 (5.2)
Religion			
Hindu	179 (38.7)	133 (28.8)	312 (67.5)
Buddhist	29 (6.3)	17 (3.7)	46 (9.9)
Muslim	38 (8.2)	30 (6.5)	68 (14.7)
Sikh	18 (3.9)	12 (2.6)	30 (6.5)
Others	4 (0.8)	2 (0.4)	6 (1.2)
Education			
Illiterate	43 (9.3)	58 (12.6)	10 1(21.9)
Primary	59 (12.8)	35 (7.6)	94 (20.4)
Secondary	82 (17.8)	66 (14.3)	148 (32.0)
Higher Secondary	46 (10)	26 (5.6)	72 (15.6)
Graduate and above	38 (8.2)	9 (2)	47 (10.2)
Occupation			
Dependant	19 (4.1)	30 (6.5)	49 (10.6)
Unskilled	111 (24.0)	56 (12.1)	167 (36.1)
Semiskilled	72 (15.6)	44 (9.5)	116 (25.1)
Skilled	26 (5.6)	32 (6.9)	58 (12.6)
Semi professional	40 (8.7)	32 (6.9)	72 (15.6)
Socio-econom	ic class		
Class I	18 (3.9)	13 (2.8)	31 (6.7)
Class II	41 (8.9)	26 (5.6)	67 (14.5)
Class III	55 (11.9)	26 (5.6)	81 (17.5)
Class IV	101 (21.9)	67 (14.5)	168 (36.4)
Class V	53 (11.5)	62 (13.4)	115 (24.9)
Type of famil	y		
Nuclear	157 (34)	71 (15.4)	228 (49.4)
Joint	97 (21)	88 (19)	185 (40)
Three	14 (3)	35 (7.6)	49 (10.6)
generation		· · · · · ·	
No. of persons			(7 (14.5)
<2	34 (7.4)	33 (7.1)	67 (14.5)
3	46 (10)	32 (6.9)	78 (16.9)
4	64 (13.9)	55 (11.9)	119 (25.8)
>5	124 (26.8)	74 (16)	198 (42.9)

According to modified B. G. Prasad classification, 168 (36.4%) were from class IV, followed by 115 (24.9%) from socioeconomic class V. Very few i.e. 31 (6.7%) were belonged to class I. Out of 462 study subjects, majority i.e. 228 (49.4%) were belonged to Nuclear family, followed by 185 (40%) from joint family and 49 (10.6%) were from three generation family. While considering the number of members in family, majority i.e. 198 (42.9%) were having family size of \geq 5, followed by 119 (25.8%) of family size 4 and lowest 67 (14.5%) were from family size of \leq 2 (Table 1).

Table 2: Distribution of study subjects according to present complaints.

Present complains	Male* (%)	Female* (%)	Total* (%)
Cough	88 (19)	75 (16.2)	163 (35.2)
Fever	67 (14.5)	56 (12.1)	123 (26.6)
Weight loss	55 (11.9)	40 (8.7)	95 (20.6)
Generalised weakness	47 (10.2)	33 (7.1)	80 (17.3)
Body ache	40 (8.7)	37 (8.0)	77 (16.7)
Burning in chest	42 (9)	32 (7)	74 (16)
Headache	38 (8.2)	30 (6.5)	68 (14.7)
Others	35 (7.5)	28 (6.1)	63 (13.6)

^{*}Multiple responses.

Most common present complain was cough by 163 (35.2%) study subjects followed by fever 123 (26.6%), weight loss 95 (20.6%), Generalised weakness 80 (17.3%) (Table 2). Among 266 participant who had habit of smoking or drinking, majority 117 (44%) had habit of smoking and 63 (23.7%) had habit of drinking alcohol while remaining 86 were having both the habits (Table 3).

Table 3: Distribution of participant according to type of habit (n=266).

Habit	Frequency (N)	Percentage (%)
Tobacco in any form	117	44
Alcohol	63	23.7
Both	86	32.3
Total	266	100.0

Table 4: Distribution of study subjects according to adherence to anti TB drugs.

Anti TB drug adherence	Number	Percentage %
High adherence	325	70.4
Medium adherence	100	21.6
Low adherence	37	8.0
Total	462	100

As per Morisky medication adherence scale-4. In the present study majority 325 (70.4%) study subjects were having high adherence followed by medium adherence in

100 (21.6%) study subjects. 37 (8%) subjects were having low adherence to anti TB drugs (Table 4).

Out of 325 high adherent to anti TB drug study subjects most of i.e. 109 (33.5%) were from age group 41-50 years followed by 81 (24.9%) in age group in age group 31-40 years. Among 137 study subjects who were poor (medium + low) adherent to anti TB drugs most of i.e. 55 (40.2%) were from age group 51-60 years. The association between age group and adherence to anti TB drugs was found to be statistically significance (p<0.05).

Table 5: Distribution of study subjects according to adherence to anti tubercular drug.

Variable	High	*Poor	χ², P value
Age in years			
<10	10 (3.1)	3 (2.2)	
11-20	23 (7.1)	5 (3.7)	
21-30	35 (10.8)	8 (5.8)	
31-40	81 (24.9)	22 (16)	$\chi^2 = 36.985$,
41-50	109 (33.5)	34 (24.8)	p<0.05
51-60	53 (16.3)	55 (40.2)	
>61	14 (4.3)	10 (7.3)	
Education			
Illiterate	31 (9.5)	70 (51.1)	
Primary	46 (14.2)	48 (35.1)	
Secondary	138 (42.5)	10 (7.3)	$\chi^2 = 161.8544$
Higher	67 (20.6)	5 (3.6)	χ=161.8544, p<0.05
secondary	07 (20.0)		
Graduate and	43 (13.2)	4 (2.9)	
above	+3 (13.2)	+ (2.7)	
Occupation of	parents		
Dependant	39 (12)	10 (7.3)	
Unskilled	111 (34.1)	56 (40.9)	
Semiskilled	78 (24)	38 (27.8)	$\chi^2 = 6.953$,
Skilled	47 (14.5)	11 (8)	p=0.13839
Semi	50 (15.4)	22 (16)	
professional	30 (13.4)	22 (10)	
Type of family			
Nuclear	155 (47.7)	73 (53.3)	,
Joint	138 (42.5)	47 (34.3)	$\chi^2=2.8808$,
Three	32 (9.8)	17 (12.4)	p=0.2456
generation		17 (12.7)	

^{*(}Medium + low adherence).

Among the study subjects having high adherent to anti TB drug, most of i.e. 138 (42.5) were educated up to secondary school followed by 67 (20.6) educated up to Higher Secondary school. Among 137 study subjects who were poor (medium + low) adherence to anti TB drugs most of i.e. 70 (51.1) were illiterate. The association between education and adherence to anti TB drugs was found statistically significance (p<0.05).

Out of 325 high adherent to anti TB drug study subjects most of i.e. 111 (34.1) were unskilled worker followed by 78 (24) semiskilled worker. Among 137 study subjects

who were poor (medium + low) adherent to anti TB drugs majority i.e. 56 (40.9) were unskilled worker. The association between occupation and adherence to anti TB drugs was not found to be statistically significance (p=0.13839).

In 325 high adherent study subjects most of i.e. 155 (47.7) were from nuclear family followed by 138 (42.5) from joint family. Among 137 study subjects who were poor (medium + low) adherence to anti TB drugs most of i.e. 73 (53.3) were from nuclear family. The association between type of family and adherence to anti TB drugs was not found to be statistically significance (p=0.2456) (Table 5).

DISCUSSION

In present study, more than half of study subjects were male and most of were in middle age group. Very few were in paediatric age group.

Similar findings were found in other studies, Unnikrishnan et al in their study observed that, majority (56.80%) of study subjects were aged below 40 years with 69.30% males and 30.70% females. ⁷ Jaiswal et al in their study found that, age group 26-45 years showed highest prevalence for tuberculosis with predominance.8 Kar et al in their study observed that majority of the patients were in the age group of 35-59 years (69.8%) and majority were male as compared to females.9 Kumar et al in their study found that most of the patients (69%) belonged to the age group of 21-40 years and in all, there were (90.5%) males and only (9.5%) females. 10 Swarooprani et al in their study revealed that maximum numbers of patients were in 30-39 years age group.11

In present study most common present complain of study subjects was cough, said by 163 (35.2%) study subjects followed by fever 123 (26.6%), weight loss 95 (20.6%), Generalised weakness 80 (17.3%) etc. Similarly, Vasava et al in their study revealed that the common presenting symptoms were fever 74%, cough 70%, weight loss 62%, haemoptysis 15%, breathlessness 34%. 12 A minor number of patients were having loose stools, chest pain. neurological manifestation like altered sensorium and seizure. Patel et al in their study found that cough was the most common symptom present in 94% patients followed by fever (86%), weight loss (78%) and loss of appetite (62%).¹³ Also dyspnoea (56%), chest pain (20%) and haemoptysis (14%) are seen. Kumar et al in their study observed that cough and expectoration were the most common symptoms observed in 97.6% patients, while 90.4% of the patients had a low-grade fever with night sweats, and anorexia with significant weight loss (>10% of the total body weight) was observed in 78.6% of the patients.¹⁰ Hemoptysis, diarrhea and peripheral lymphadenopathy were observed in 13 (31%), 17 (40.5%) and five (11.9%), respectively. Oral thrush was observed in 12 (28.6%) and skin rashes in one (2.4%) patient. Neurological symptoms (headache, altered sensorium, seizures, etc.) were reported by three (7.2%) patients.

In the present study majority 325 (70.4%) study subjects were having high adherence followed by medium adherence in 100 (21.6%) study subjects. 37 (8%) subjects were having low adherence to anti TB drugs. Age and education of study subject was found to statistically significant for adherence to anti tubercular treatment.

Similarly, Bagchi et al in their study of determinants of poor adherence to anti tuberculosis treatment in Mumbai, India found that out of the 538 patients, 451 (84%) were adherent and 87 (16%) were non-adherent. Hen were more likely to be nonadherent than women, but the difference was small. Smoking during treatment and travel-related cost factors were significantly associated with non-adherence in the newly-diagnosed patients, while alcohol consumption and shortage of drugs were significant in the residual groups.

In contrast, Kulkarni et al studied non-adherence of new pulmonary tuberculosis patients to anti-tuberculosis treatment; and reported that out of 156 newly diagnosed pulmonary TB patients 78 (50%) were non-adherent to anti-tuberculosis treatment (ATT). Independent risk factors for non-adherence were identified as male gender (p=0.035) and lack of knowledge of importance of regular treatment (p=0.001). Being female sex worker (FSW) was also an absolute risk factor for non-adherence which concludes that there is immense need for continuous, effective and reinforcing health education to the patient and his family. Special groups like males in the age group of 15-49 years, patients who do not have any family support like migrants, FSW need special attention to ensure adherence to ATT.

CONCLUSION

In conclusion, this study evaluated the extent of adherence in tuberculosis patients receiving DOTS therapy and various potential risk factors contributing to non-adherence. About 8% of the patients were having low adherent. Aged patients, illiterate, unskilled workers, patients living in nuclear family were found to be having poor adherence to treatment. Age and education of study subject was found to be significantly associated with adherence.

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Ethical approval: The study was approved by the Institutional Ethics Committee

Institutional Ethics Committee

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