SHORT ARTICLE

Factors affecting treatment outcome among Pulmonary Tuberculosis patients under RNTCP in urban Pondicherry, India

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Citation

Article Cycle

Abstract

Background: Many factors associated with unsuccessful TB treatment outcome. **Objective**: To find out the factors affecting treatment outcome among Pulmonary Tuberculosis patients under RNTCP in urban Pondicherry, **Methods**: A cross-sectional study was conducted among 265 PTB patients from 6 randomly selected urban PHCs of Pondicherry from Jan 2013 to March 2014. A Pre-tested questionnaire was used. Data were entered in Epi-data v3.1 and was analysed by SPSS v20. Chi-square test and multiple logistic regressions were used. **Results:** Out of 265 patients registered 235 (88.7%) patients were included. The Majority were males (79.6%), and Mean (SD) age was 44±14 years. The Majority (83.4%) were formally educated, 74% were employed, and 77% received Cat I treatment. Prevalence of alcohol drinkers, current smokers and smokeless users was 31.5%, 23.5%, 9.4% respectively. A total of 14.5% had bad treatment Outcome Univariate analysis showed that Current smoker and Category II PTB treatment had significantly associated with bad outcome (p value-<0.05). In Multivariate analysis, Category II PTB treatment [AOR = 3.5 (1.6-7.8)] had significantly associated with bad outcome (p value-<0.05) after adjusted with age group, gender, Smoking and alcohol status **Conclusion**: Current Smoking and Category II PTB Treatment were the major factors affecting the TB treatment outcome

Key Words

Pulmonary Tuberculosis; Treatment Outcome; Urban; Pondicherry

Introduction

Tuberculosis continues to be a major public health problem in the world. India is one of the high TB burden countries contributing to almost 1/4th of global TB cases. As per World Health Organization (WHO) estimated burden of tuberculosis in India, 2012 incidence of TB was 176 per 100000 and the prevalence was 230 per 100000 population.(1)

The DOTS is now accessible to everywhere in India. The overall programme performance, particularly, with regards to high cure and low default rates has been consistent in recent years. In India, RNTCP 2014 report said among New Smear Positive patients the success, default, failure, death rates were 87%, 6%, 2% and 4% respectively for the past ten years (2002-2012). Similarly, among Smear Positive Retreatment patients the success, default, failure, death rates were 70%, 14%, 5% and 8% respectively for the past ten years (2002-2012). This shows that there was not much change in the treatment outcome of the TB patients in India in the recent years. (1)

In Pondicherry, in compare to National average, RNTCP 2014 report said that among New Smear

Positive patients the success, default, failure, death rates were 83%, 5%, 5% and 6% respectively. Similarly, among Smear Positive Retreatment patients the success, default, failure, death rates were 62%, 16%, 11% and 9% respectively.1 Poor treatment adherence increasing the risk of drug resistance, treatment failure, relapses, deaths and prolonged infectiousness remains a hurdle to the success of tuberculosis programme.(2) During 1960-70s, major reasons identified for poor completion rates included shortage of drugs, inadequate staff and poor patient follow-up.(3) In recent years, various research studies found that male sex, alcoholism, smoking, category of treatment, travel expenses, poor patient information and communication as the major determinants of non-adherence to anti-TB treatment. (4–7) There were no study published in Pondicherry related to factors affecting the outcome of TB patient's treatment.

Aims & Objectives

To find out the factors affecting the outcome of pulmonary tuberculosis patient treatment registered under RNTCP in urban Pondicherry

Material and Methods

This was a community-based cross-sectional study carried out between January 2013 and March 2014 in Pondicherry district. The total population of Pondicherry (8) is 12,44,464. Around 68% of populations in Pondicherry live in urban areas. The study was restricted to urban PHCs of Pondicherry. Six out of twelve urban PHCs (9) was selected randomly. Inclusion criteria were PTB patients aged 15 years and above. Category IV tuberculosis patients were excluded. All the eligible consecutive PTB patients from selected six PHCs were included in the study. Thus, the total of 265 PTB patients was selected for the study. The location of these six PHCs were scattered all over urban Pondicherry; thus this was expected to represent total PTB patients of urban Pondicherry.

Eligible patients were interviewed in the Continuation Phase (CP) of their TB treatment. During the Intensive Phase (IP) of TB treatment, patients are frequently monitored by health worker. Thus during the IP patient motivation to follow advice and adopt healthy lifestyle is high, study during the IP may falsely undermine factors affecting PTB patients treatment. Interviewing them during the continuation phase of TB treatment may reflect the true picture of factors affecting PTB patient's

treatment. Selected PTB patients outcome details were collected from each PHC at the end of the data collection.

Demography details of eligible PTB patients were obtained from the TB treatment cards maintained for each patient in their respective PHCs. All the eligible TB patients were contacted at their place of residence. Adequate time was spent with each PTB patient to build up a rapport with them, and informed consent was taken from participants before collecting information. The houses which were either locked or where the patient was not present at the time of the visit were revisited one more time at a later date. Patient who could not be contacted during both visits were not contacted further.

A pre-tested interview schedule was used to collect information from the study participants Socio-demographic factors like age, gender, education, occupation, family type, housing status were obtained from the subject by personal interview. Alcohol drinkers: PTB patients who consumed alcohol any time after the diagnosis to till the date of interview. The definitions for smoked and smokeless tobacco users as followed in the GATS India10 were used in the present study. Current smoker: "Those who had smoke in the past one month"; Current smokeless user: "Those who had used smokeless tobacco in the past one month".

Data analysis: Data were collected and entered in the Epidata version 3.1. It was exported to excel and was analyzed using IBM SPSS version 20. Description of all socio-demographic variables, alcohol drinkers, smokers and tobacco users among PTB patients was reported in percentages. Univariate analysis was carried out to find out the factors associated with Bad outcome of PTB treatment. Multivariate analysis was then done using logistic regression analysis to identify the independent effect of predictor variables) on Treatment outcome (dependent variable) by calculating the adjusted Odds Ratio. P value for significance testing was set at the level of 0.05.

Results

Out of the total 265 pulmonary tuberculosis patients registered in the select 6 PHCs during the study period, 235 (88.7%) were included, and 30 (11.3%) patients could not be contacted in the study. Among the 30 PTB patients, 15 (5.1%) could not be contacted even after two house visits (not available

in both occasions); 15 (5.6%) had shifted the residence which was recorded as "change of address" in RNTCP treatment card. The mean (SD) time interval between initiation of Continuation phase TB treatment and data collection was 12± 4 weeks.

The Majority of the PTB patients were males (79.6%). Mean (SD) age were 44±14 years. Majority (83.4%) of the PTB patients were formally educated and 16.6% had No formal education. Nearly 74% of them were employed and 26% were Unemployed. Nearly half (49%) of them belonged to lower SES. More than three-fourth of PTB patients received Cat I (77%) treatment and the rest were put on Cat II regimen (Table 1). Prevalence of alcohol drinkers, current smokers and current smokeless users were 31.5% (74), 23.5% (55) and 9.4% (23) during treatment respectively.

Among the total PTB patients, cured rate, completed rate, default rate, failure rate and mortality rate were 73.2%, 12.3%, 6.8%, 5.1% and 2.6% respectively. A total of 85.5% had Good Outcome (Cure rate + Completion rate) and 14.5% had bad Outcome (Default + Failure +Death Rate).

Factors affecting Outcome of PTB Treatment among Urban Pondicherry: Univariate analysis showed that Current smoker and Category II PTB treatment had significantly associated with bad outcome (p value-<0.05). Other factors like Age Group, Gender, Education Status, Occupation Status, Socio-Economic Status, Alcohol Status, Smokeless user, Family type had not associated with TB Treatment outcome (Table 2). Smoking status, Category of PTB treatment as well as factors; Age Group, Gender and Alcohol status were included in the Multiple Logistic regression. Category II PTB treatment [AOR = 3.5 (1.6-7.8)] had significantly associated with bad outcome (p value-<0.05) after adjusted with age group, gender, Smoking and alcohol status (Table 3)

Discussion

In the present study found that 85.5% had good outcome and 14.5% had bad treatment outcome among the selected urban PTB patients in Pondicherry 2013-2014. Uni-variate analysis found that current smoker and category II TB treatment were significantly associated with the bad treatment outcome. Multi-variate analysis found only Category II treatment was the significant factor for bad treatment outcome. This shows that retreatment PTB patients should be properly monitored to improve the status of treatment outcome. These findings were similar to other studies done in Mumbai, South India. (5,6,11)

In the present study found no significant association among male gender with the bad outcome. This finding was similar to studies done in South India by Gopi P.G et al (12) and study done in Mumbai by Bagchi S et al. (11) It was different to other studies done by Mukherjee A et al,(7) Jaggarajamma K et al (13) and Santha T et al.(5) Similarly, present study found that age group was not the significant factor. Similar finding was found from the study done in South India by Jaggarajamma K et al (13) and it was different to other studies done by Santha T et al5 and Gopi P.G et al.(12) Similarly, the present study found that literate was not the significant factor. Similar finding was found from the studies done in South India by Jaggarajamma K et al (13) and Santha T et al.(5) It was different to studies done by Gopi P.G et al (12) in South India and Vijay S et al.6 Similarly, the present study found that occupation-employment was not the significant factor. Similar finding was found from the studies done in South India by Jaggarajamma K et al (13) and Santha T et al.(5) In the present study also found that Socio-economic status, Family type, Current smokeless user and Current drinkers were not the significant factor for affecting the PTB treatment outcome. Besides that many other studies found that alcohol was the significant factor affecting the PTB treatment outcome. These differences could be due to study settings, sample size and the time of study.

Strengths: Almost 89% of the PTB patients in the selected 6 PHCs were covered in this study. The location of the 6 selected PHCs were scattered all over urban Pondicherry. It is expected that selected PHCs will be representative of the total urban PTB patients of Pondicherry. Thus generalization of the study findings can be done to all TB patients in urban Pondicherry

Conclusion

Previous studies found that age, literacy, male gender, alcoholism, Smoking, Category of PTB treatment were the factors affecting PTB treatment outcome. However, in the present study found that Current Smoking and Category of PTB Treatment were the major factors affecting the TB treatment Outcome by uni-variate analysis. In Multivariate analysis only Category of TB treatment were significantly affecting the TB Treatment Outcome

Recommendation

Health worker and DOTS provider should take proper monitoring activities to the retreatment cases to decrease the bad outcome in future.

Limitation of the study

The present study, participants were PTB patients attending government health facilities. Thus the findings from the study are applicable to PTB patients attending government health facilities only. Another likely bias due to self-report on alcohol use and tobacco use by the study participants cannot be ruled out

Relevance of the study

Even now significant number of Retreatment PTB patients are end up with bad outcome.

Authors Contribution

V AM, SKS: involved in Concepts, Design, Definition of intellectual content, Literature search, Data acquisition, Data analysis, Statistical analysis, Manuscript preparation, Manuscript editing, Manuscript review. SS, SK: involved in Statistical analysis Manuscript editing, Manuscript review.

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Tables

TABLE 1 SOCIO-DEMOGRAPHIC DETAILS OF PTB PATIENTS FROM URBAN PHCS OF PONDICHERRY

Variables	N (%)
Age Group (in years)	
<45	122 (51.5)
≥45	113 (48.5)
Gender	
Male	187 (79.6)

Female	48 (20.4)
Education Status	
No formal education	39 (16.6)
Formally educated	196 (83.4)
Occupation	
Unemployed	63 (26.8)
Employed	172 (73.2)
Socio-Economic class	
Upper and Middle class	120 (51.1)
Lower class	115 (48.9)
Category of TB Treatment	
Cat I	181 (77)
Cat II	54 (23)
Total	235 (100)
Current Smoker	
Not current smoker	180 (76.6)
Current smoker	55 (23.4)
Current Smokeless User	
Not current user	212 (90.2)
Current user	23 (9.8)
Alcohol Status	
Not drinker	161 (68.5)
Drinker now	74 (31.5)
Total	235 (100)

TABLE 2 FACTORS AFFECTING THE OUTCOME OF PTB TREATMENT IN URBAN PONDICHERRY

Variables	Bad Outcome N (%)	Good Outcome N (%)	Total	X2 (df)	P value
AGE GROUP					
<45	13 (10.7)	109 (89.3)	122 (100)	2.98(1)	0.084
≥45	21 (18.6)	92 (81.4)	113 (100)		
GENDER					
Female	4 (8.3)	44 (91.7)	48 (100)	1.83(1)	0.176
Male	30 (16)	157 (84)	187 (100)		
EDUCATION					
No formal education	6 (15.4)	33 (84.6)	39 (100)	0.032(1)	0.859
Formally educated	28 (14.3)	168 (85.7)	196 (100)		
OCCUPATION					
Unemployed	8 (12.7)	55 (87.3)	63 (100)	0.218(1)	0.641
Employed	26 (15.1)	146 (84.9)	172 (100)		
SOCIO-ECONOMIC STATUS					
Middle & above	14 (11.7)	106 (88.3)	120 (100)	1.55(1)	0.212
Lower	20 (17.4)	95 (82.6)	115 (100)		
FAMILY TYPE					
Nuclear family	19 (13.6)	121 (86.4)	140 (100)	0.226(2)	0.893
Joint family	5 (15.6)	27 (84.4)	32 (100)		
Three generation family	10 (15.9)	53 (84.1)	63 (100)		
CURRENT SMOKELESS USER					
Not current user	29 (13.7)	183 (86.3)	212 (100)	1.08(1)	0.297
Current user	5 (21.7)	18 (78.3)	23 (100)		
CURRENT SMOKER					
Not current smoker	20 (11.1)	160 (88.9)	180 (100)	7(1)	0.008*
Current smoker	14 (25.5)	41 (74.5)	55 (100)		
DRINKER					

Not drinker	21 (13)	140 (87)	161 (100)	0.839(1)	0.360
Drinker now	13 (17.6)	61 (82.4)	74 (100)		
CAT					
Cat I	18 (9.9)	163 (90.1)	181 (100)	13.02(1)	<0.001*
Cat II	16 (29.6)	38 (70.4)	54 (100)		
Total	34 (14.5)	201 (85.5)	235 (100)		

X2- Chi-square test, *-p value significant

TABLE 3 MULTIPLE LOGISTIC REGRESSION OF FACTORS AFFECTING THE PTB TREATMENT OUTCOME

Variables	AOR (CI)	P value
Age Group		
<45	1	0.145
≥45	1.8 (0.8-3.9)	
Gender		
Female	1	
Male	1.2 (0.4-3.9)	0.81
Category of PTB Treatment		
Cat I	1	
Cat II	3.5 (1.6-7.8)	0.02*
Smoking Status		
Not current smoker	1	
Current smoker	2.2 (0.91-5.5)	0.07
Drinker		
Not drinker	1	
Drinker now	0.76 (0.3-1.9)	0.55

AOR= Adjusted Odds Ratio, CI-Confidence Interval, *-p value significant