International Journal of Community Medicine and Public Health
Bineni C et al. Int J Community Med Public Health. 2017 Jan;4(1):146-149
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20164727

Original Research Article

Default rate and its awareness in management of tuberculosis in Chittoor district population, Andhra Pradesh, India

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Received: 05 September 2016
Revised: 10 October 2016
Accepted: 15 November 2016

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ABSTRACT

Background: Default rate is the most essential feature of the DOTS strategy itself and also especially relevant in view of increased prevalence of drug resistance tuberculosis. The aim of the present study was conducted to give awareness on default rate in management of tuberculosis.
Methods: A total of 229 patients with smear positive tuberculosis cases of both category-I and category-II from DOTS centre in tuberculosis, S.V.R.R. Government General Hospital, Tirupati, A.P, India were enrolled and registered for the present study. Consent was taken from the patients to give awareness on default rate role in management of Tuberculosis in Chittoor district population.
Results: Higher default rate is found among those employed 12.4% compared to those unemployed 4.3% and the difference is also found to be statistically significant. The defaulter rate has been found to be higher in those with 3 + sputum grading 12.4% followed by 1 + grading 7.9%.
Conclusions: Default rate in the present study is high which points out that even with DOTS therapy, there can be significant default rate. So it is recommended that DOTS providers are periodically supervised and explained on the need to ensure full compliance and minimize the rate.

Keywords: Default rate, DOTS, Tuberculosis

INTRODUCTION

Tuberculosis remains one of the world's deadliest diseases. Revised National Tuberculosis Control Programme (RNTCP) is the largest and the fastest expanding programme in the world. In 2009 alone 1.53 million patients were stated on treatment. Efforts need to be made to create awareness in the society about tuberculosis.[1] Traditional risk factors for noncompliance like socio-demographic factors, timing, travel, cost of investigation and long waiting period were not major hurdles for treatment adherence. The toxicity of drugs was the major reason for defaulting for treatment.[2] Default case is conventionally considered as the case who did not take treatment for duration of consecutively 2 months or more. Reasons for initial default were unwillingness, symptoms being mild, personal reasons and dissatisfaction. There is an urgent need to improve

the patient's perception of treatment and strengthen the health systems' capabilities to reduce initial default.[3] The present study was conducted to give awareness on default rate and its importance in management of tuberculosis in Chittoor district population.

METHODS

In the present study a total of 229 patients attending to the clinic of DOTS centre Tuberculosis Unit, S. V. R. R. Government General Hospital, Tirupati, Andhra Pradesh, India were registered and enrolled to study the default rate role and its awareness in management of Tuberculosis in Chittor district population. All the smear positive Tuberculosis cases of both category-I and category-II registered were enrolled as study subjects. The study was explained and permission obtained from the DTCO, DMHO, MO-TC, HOD of Pulmonary medicine and concerned DOTS providers of study area after the clearance from Ethical committee. Consent was taken from all the patients and followed up till the completion of their treatment in the present study.

RESULTS

The defaulter rate has been slightly higher in 25 -50 years' age group 11.6% compared to other age groups. However the differences are not statistically significant. Higher proportion of default rate was found in males 10.1% compared to that in females 5.9% but the difference is however not statistically significant (Table-1).

Table 1: Age group and gender by default rate.

Variable	Default rate (%)	Statistical significance
Age group (years)		
< Less than 25	1 / 37 (2.7)	*χ2=0.06; P=0.80; NS
25-50	14 / 121 (11.6)	
50 & above	6 / 71 (8.5)	
Gender		
Male	18 / 178 (10.1)	Fisher's P Value = 0.26; NS
Private	3 / 51 (5.9)	

The defaulter rate has been found to be higher in category I (9.6%) compared to that of category II (9.0%) but the difference is however not found to be statistically significant (Table 2).

Table 2: DOTS category by default rate.

DOTS category	Default rate (%)	Statistical significance
Category I	16 / 177 (9.0)	Fisher's P Value = 0.54; NS
Category II	5 / 52 (9.6)	

The defaulter rate was found to be higher in Christians 15.4% compared to that in Hindus 8.1% and Muslims 11.8% but however there is no statistically significant difference among them. Higher defaulter rates is found with regard to scheduled tribes 14.8% and least in other castes 5.0% but the differences are not statistically significant (Table 3).

Table 3: Religion and social category by default rate.

Variable	Default rate (%)	Statistical significance
Religion		
Hindu	15 / 186 (8.1)	*χ2=1.45; P=0.23; NS
Muslim	2 / 17 (11.8)	
Christian	4 / 26 (15.4)	
Social status		
Scheduled caste	7 / 56 (12.5)	*χ2=2.72; P=0.26; NS
Scheduled tribe	4 / 27 (14.8)	
Backward caste	8 / 106 (7.5)	
Other caste	2 / 40 (5.0)	

The defaulter rate is found to be comparatively higher in those belonging to lower level of socio-economic status 12.5% and nil in upper socio-economic status. It can be seen that the defaulter rate increased with decrease in the level of socio-economic status. However the differences are not statistically significant (Table 4).

Table 4: Socio-economic status by default rate.

Socio-economic status	Default rate (%)	Statistical significance
Upper	0 / 2 (0.0)	*χ2=1.81; P=0.41; NS
Upper middle	3 / 56 (5.4)	
Lower middle	5 / 61 (8.2)	
Upper lower	10 /86 (11.6)	
Lower	3 / 24 (12.5)	

Higher default rate is found among those employed 12.4% compared to those unemployed 4.3% and the difference is also found to be statistically significant. Higher defaulter rate was found in illiterates 12.7% and secondary level of education 11.4% compared to other levels of educational status. However the differences are not found to be statistically significant. The defaulter rate was found to be higher among divorced group compared to other groups but the difference is however not statistically significant (Table 5).

The defaulter rate was found to be comparatively better in those coming from third generation family 11.1% than other types of families but the differences are not statistically significant. Those living in urban slum areas had higher defaulter rate 10.8% compared to other groups but the difference is not statistically significant. Those living alone had higher defaulter rate than those living along with family but the difference is not statistically significant. Defaulter rate has been found to be higher in those with overcrowding in the house 9.1% but the difference is not statistically significant (Table 6).

Table 5: Employment, education and marital status by defaulter rate.

Variable	Default rate (%)	Statistical significance
Employment		
Employed	17 / 137 (12.4)	$\chi2$=4.29; P=0.038; S
Unemployed	4 / 92 (4.3)	
Educational status		
Illiterate	13 / 102 (12.7)	*$\chi2$=1.67; P=0.19; NS
Primary	1 / 20 (5.0)	
Secondary	4 / 35 (11.4)	
Higher secondary	2 / 43 (4.7)	
Degree & above	1 / 29 (3.4)	
Marital status		
Currently married	14 / 136 (10.3)	*$\chi2$=0.08; P=0.77; NS

Table 6: Type of family, residential status, staying with family and overcrowding by default rate.

Variable	Default rate (%)	Statistical significance
Type of family		
Nuclear	14 / 165 (8.5)	*$\chi2$=0.33; P=0.56; NS
Joint	5 / 46 (10.9)	
Third generation	2 / 18 (11.1)	
Residential status		
Rural	13 / 140 (9.3)	*$\chi2$=0.01; P=0.93; NS
Urban slum	4 / 37 (10.8)	
Urban non-slum	4 / 52 (7.7)	
Staying with family		
Yes	19 / 209 (9.1)	Fisher's P Value = 0.57; NS
No (living singly)	2 / 20 (10.0)	
Overcrowding (N=227)		
Yes	14 / 154 (9.1)	$\chi2$=0.05; P=0.83; NS
No	6 / 73 (8.2)	

The defaulter rate has been found to be higher in current smokers 13.7% compared to non-smokers 7.9%. Similarly, higher level of defaulter rate was found in current alcoholics 13.6% than non-alcoholics 7.6%. A slightly lower level of defaulter rate was found in those chewing tobacco 7.1% compared to those who are not 9.5%. However the differences with regard to smoking, chewing tobacco and alcohol intake are however not found to be statistically significant (Table 7).

The defaulter rate has been found to be similar with regard to HIV status as well as previous tuberculosis. With regard to past history of previous tuberculosis treatment, it was found that the defaulter rate is higher among those who had taken treatment for more than 1 month 14.3% compared to other groups. However, there is no statistically significant difference with regard to all the above variables (Table 8).

Table 7: Current smoking, tobacco chewing and alcohol intake by default rate.

Variable	Default rate (%)	Statistical significance
Current smoking		
Yes	7 / 51 (13.7)	Fisher's P Value = 0.16; NS
No	14 / 178 (7.9)	
Current chewing of tobacco		
Yes	2 / 28 (7.1)	Fisher's P Value = 0.51; NS
No	19 / 201 (9.5)	
Current alcohol intake		
Yes	8/ 59 (13.6)	$\chi2$=1.83; P=0.17; NS
No	13 / 170 (7.6)	

Table 8: HIV status, previous tuberculosis and history of treatment for tuberculosis by default rate.

Variable	Default rate (%)	Statistical significance
HIV status		
Positive	1 / 21 (4.8)	Fisher's P Value = 0.40; NS
Negative	20 / 208 (9.6)	
Previous tuberculosis		
Yes	1 / 13 (7.7)	Fisher's P Value = 0.61; NS
No	20 / 216 (9.3)	
History of previous tuberculosis treatment		
Never taken	20 / 217 (9.2)	Fisher's P Value = 0.49; NS
< 1 month	0 / 5 (0.0)	
> 1 month	1 / 7 (14.3)	

The defaulter rate has been found to be higher in those with 3 + sputum grading 12.4% followed by 1 + grading 7.9% but the differences are not found to be statistically significant (Table 9) in the present study.

Table 9: Sputum grading at the beginning of the treatment by defaulter rate.

Sputum grading	Defaulter		Total (%)
	Yes (%)	No (%)	
Scanty	1 (6.7)	14 (93.3)	15 (100.0)
One +	6 (7.9)	70 (92.1)	76 (100.0)
Two +	2 (4.9)	39 (95.1)	41 (100.0)
Three +	12 (12.4)	85 (87.6)	97 (100.0)
Total	**21 (9.2)**	**208 (90.8)**	**229 (100.0)**

DISCUSSION

In the current study, out of a total of 229 patients, 9 patients defaulted during intensive phase and 12 patients defaulted during maintenance phase of treatment. Thus a total of 21 patients had defaulted during the study giving the defaulter rate of 9.2%. A similar rate of 6.1% was fund in Karnataka study.[4] A slightly higher defaulter rate 15.1% was found in Agra study with highest prevalence among the 16-30 years age group.[5] Similarly a higher rate

16.8%, intensive phase – 6.9% and continuation phase – 9.8%) was reported in a study in Kanpur.[6] A very high defaulter rate was reported in Ghana 55.7%.[7] A lower prevalence was found in a study in Gujarat 6.9%, a study in Mumbai 6.8% and New Delhi study 1.4%.[8-10] The defaulter rate has been found to be higher in divorced group 20.0%, those with duration of symptoms 6 weeks 17.6%, treatment at patient's house 16.7%, Christians 15.4%, history of previous treatment for tuberculosis for more than 1 month 14.3%, current smokers 13.7%, current alcoholics 13.6%, illiterates 12.4%, lower socioeconomic status 12.5%, employed 12.4%, 25-50 years age 11.6%, third generation family 11.1%, urban slum 10.8% and males 10.1%. However differences were not significant with any of the factors mentioned above. Similar prevalence was observed with other factors like tobacco chewing and HIV status. In a study in Tiruvallur, the factors influencing default were found to be male sex, age more than 45 years, illiteracy, smoking and alcohol intake.[11] A study in Brazil has found factors like peer education, alcoholism, TB-HIV co morbidity to be factors influencing default during treatment.[12] The most common reasons for default were found to be relief from symptoms 76.2%, lack of awareness 66.7%, side effects 66.7% and sense of well being 57.1%. The study in Ghana has found the reasons for default as distance 73.1%, finance 67.9%, stigma 60.3% etc. In the Agra study, the common reasons for default were found to be side effects of drugs 43.2%, lack of time 13.5%, no relief 10.8%, lack of awareness 9.9% and out of station 8.1%. In the Chattisgarh study, the common reasons found were felt better 34.5%, side effects 20.3%, out of station 15.5%, no time 6.4% and long distance 1.7%.[13] In the Kanpur study, the reasons were found to be feeling good 89.5%, loss of faith in treatment 45.0%, side effects 31.6% and out of station 35.1%.[6] Further, it was found that the defaulter rate has been found to be higher in those with 3 + sputum grading 12.4% followed by 1 + grading 7.9% but the differences are not found to be statistically significant in the present study.

CONCLUSION

DOTS providers should be periodically supervised and explained on the need to ensure full compliance and minimize the failure and default rates. Specific actions are to be taken to contact the defaulters to find out the reasons and to motivate them for completion of treatment.

ACKNOWLEDGEMENTS

Authors acknowledge Faculty of Department of Community Medicine, SV Medical College, Tirupathi for their valuable suggestions during this work.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Bineni C, Gorantla AK, Reddy KAK. Default rate and its awareness in management of tuberculosis in Chittoor district population, Andhra Pradesh, India. Int J Community Med Public Health 2017;4:146-9.