Association of Treatment Outcome of Tuberculosis with type of Category of Tuberculosis

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Abstract— Tuberculosis is the third major cause of adult mortality i.e. 15-59 years of age group on which the nation's economy depended on. In treatment of tuberculosis, failure of treatment and defaulters of treatment are the main hurdles. So this study was carried out with the aim to find out association of treatment outcome with category of case and diagnosed in various four quarters of year. For the study purpose 160 case sheets of tuberculosis patients attended at District Tuberculosis Centre, Jaipur were taken, by identify 40 cases randomly from each of four quarter. Chi-square test was used to find out association. It was found in this study that maximum cases were of category II followed by I and II. Cure rate was found 44.38% with maximum in category III (60.42%). Defaulter rate was found 32.5% with maximum in category II (35.48%). Failure rate was found 9.38% with maximum in category I(14%). And Case Fatality Rate was found 32.5% with maximum in category II(20.97%).This variation in treatment outcome was found significantly associated for Cure rate and CFR not for Defaulter and Failure rate.

Key words: Tuberculosis, Cure rate, Defaulters, Failure rate and Case Fatality Rate

1. Introduction

"Captain of all the men of death" as the T.B. is known one of the most prevalent infectious disease worldwide. Tuberculosis is a disease caused by Mycobacterium Tuberculosis; has affected mankind for over 5000 yrs.[1] and continue to be a major public health problem. It is leading cause of adult mortality ranking 3rd after HIV/AIDS and IHD among aged 15-59 years.[2] This age group is the group n which nation's economy depend on, so should take care of more.

India being identified as one of the "HOT ZONES" i.e. highest TB burden country accounting for approximately 1/5th (20%) of Global T.B. burden having.[3] It has 1.8 million new TB cases per year with 0.8 million are new smear positive and 0.37 million people dies due to T.B.

As per RNTCP target – Target for Cure Rate is more than 85% and target for Failure Rate, Defaulter Rate and Relapse Rate are less than 5% for each category.

There is very varied response from different parts of country about the targets.[4] On the above very few studies are done to find out the possible association with these outcome targets. So this study is an effort in this direction to find out the association of tuberculosis treatment outcome with type of regime given in various categories.

2. Methodology

A record based case-series type of observational study was carried out in District Tuberculosis Centre (DTC) of SMS Hospital, Jaipur (Raj.). Records of tuberculosis patents attended at DTC of year 2008 were reviewed and 40 case sheets from each of quarter were identified randomly. All the information about tuberculosis patients with their outcome was recorded from their respective identified records. Treatment outcome was observed as Cured, Defaulter, Failure, Relapse and Death, transfer out cases were recorded but excluded from the analysis. Treatment outcome was assessed in the form of Cure Rate, Defaulter Rate, Failure Rate and Case Fatality Rate. Category treatment regimen was accepted as per DOTs[5]. Association of treatment outcome was assessed with Chi-square test.
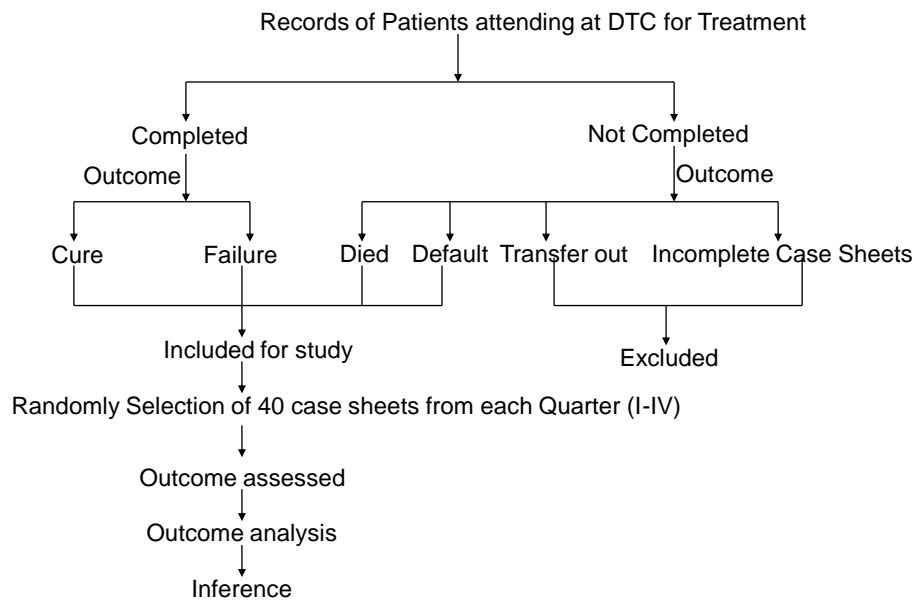
3. Results

In this present study it was observed that out of total 160 tuberculosis patients maximum were of category II i.e. 62 (38.75%) followed by category I and Category II (Fig. 1).

When overall treatment outcome of these 160 cases were observed it was found that Cure rate was 44.38% and Case fatality Rate was 14.38%. Defaulters and Failures were 32.5% and 9.38% respectively. (Fig 2)

Figure 1	Figure 2
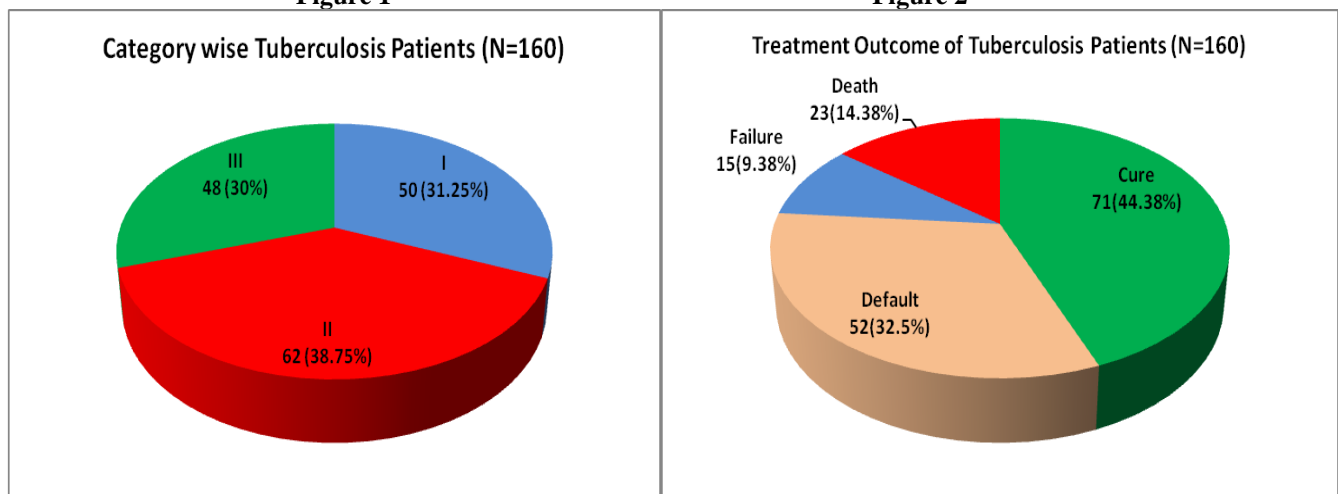
When category of cases were seen as per the quarter of year, it was observed that although maximum cases of category I were in quarter IV whereas of category II and III were in quarter III and I respectively but this distribution of cases as per category in various four quarters was not with significant variation (p>0.05). (Table 1)

Table 1
Category and Quarter wise Distribution of Tuberculosis Cases

S. No.	Category	Quarter				Total	
		I(Jan-March)	II(Apr-June)	III(July-Sept)	IV(Oct-Dec)	No.	%
1	**I**	12	12	12	14	50	31.25
2	**II**	14	16	17	15	62	38.75
3	**III**	14	12	11	11	48	30
4	Total	40	40	40	40	160	100

Chi-square = 1.063 with 6 degrees of freedom;   P = 0.983   LS=NS

When quarter wise treatment outcome of tuberculosis cases were observed it was found that although Cure cases were maximum in Quarter IV and Defaulter, Failure and death of cases were minimum in quarter IV but treatment outcome of cases in various four quarters was not having significant variation (p>0.05). (Table 2)

Table 2
Quarter wise Treatment Outcome of Tuberculosis Cases

S. No.	Quarter	Treatment Outcomes				Total
		Cure	Default	Failure	Death	Total
1	Q. I	17	15	5	6	40
2	Q. II	15	14	4	6	40
3	Q. III	19	12	3	6	40
4	Q. IV	20	11	3	5	40
5	Total	71 (44.38%)	52 (32.5%)	15 (9.38%)	23 (14.38%)	160
Chi-square at 3 DF P Value LS		1.494 0.936 NS	1.140 0.998 NS	0.809 0.999 NS	0.152 1 NS	

Chi-square =   2.203 with 9 degrees of freedom;   P = 0.999   LS=NS

Category wise treatment outcome of tuberculosis cases was with significant variation (p<0.001). When each of the treatment outcomes was seen as per category, it was found that proportion of cured cases and cases that died were having significant variation (p<0.05) as per category of cases whereas defaulter cases and failure cases were not having significant variation (p>0.05). Cure Rate was best in category III (i.e. 60.42%) cases followed by category I and II which have 42% and 33.87% respectively. And Case Fatality rate was maximum in category II (i.e. 20.97%) followed by category I and III which have 16% and 4.17% respectively. (Table 3)

Table 3
Category wise Treatment Outcome of Tuberculosis Cases

S. No.	Category	Treatment Outcomes				Total
		Cure	Default	Failure	Death	
1	I	21	14	7	8	50
2	II	21	22	6	13	62
3	III	29	16	2	02	48
4	Total	71	52	15	23	160
Chi-square at 2 DF P Value LS		7.892 0.019 S	0.728 0.695 NS	2.798 0.247 NS	7.892 0.019 S	

Chi-square =   29.107 with 6 degrees of freedom;   P <0.001   LS=S

4.   Discussion:

In the present study maximum were of category II (38.75%) followed by category I and Category II, whereas other authors[4,9,12,13] reported maximum tuberculosis cases of category I in their studies. When these cases were observed as per each of quarter it was found that category I cases were maximum in quarter IV whereas category II and III cases were maximum in quarter III and I respectively. Quarter IV observations were well comparable to other authors[4,9,12,13].

Cure Rate in this study was observed 44.38% whereas in majority of studies it is shown very high ranging from 53.8% to 91%.[4,8,9,12] In the present study it was observed less may be because of more proportion of category II cases in comparison with other studies, which was further supported with the fact that cure Rate was observed minimum in category II. Other studies also reported cure Rate minimum in category II. [4,6,8,10] Cure Rate is varied as per the category of case (p <0.001) in this study which was supported with finding of R.K. Mehra etall who reported Cure Rate 87.9%,76.4% and 48.8% in category I, Relapse and Failure cases respectively.[7] Vijay etall also observed only 39.8% Cure Rate in category II.[10] K etall14 reported Cure rate among Category I was calculated to be 61.7% (37/60). These findings were also well in resonance with observations of present study in this regards.

In the present study Defaulter Rate was observed 32.5% which was well comparable to observations of Vijay etall[10] however Annual status report of RNTCP (2009) reported Defaulter Rate 6% India and 5% in Rajasthan respectively. Difference in Defaulter Rate as per category of cases was not found significant (P value>0.05) in this study which was well comparable to findings of other authors.

Failure Rate was observed 9.38% in the present study which is near to observations of Vijay etall (5.2%)[11], but was quite higher than observed by RNTCP Annual Report 2009 (2%) and other authors studies.[4,8,9,10] Difference in Failure Rate as per category of cases in present study was found not significant (P value >0.05) however other studies[4,6,9] reported higher failure Rate in category II.

Case Fatality Rate in present study was observed 14.38% which was quite higher observed by RNTCP annual Status Report[4] (4% in India and 3.6% in Rajasthan) and Vijay etall[11] who observed 2.2% CFR in their study. Even Karanjekar etall[13] also reported lesser CFR (5%) in their study. Difference in CFR as per category of cases was observed significant (P value <0.05) and is highest in category II cases followed by category I and III. These observations regarding CFR as per category of cases were well in resonance with RNTCP annual Status Report[4] observed maximum CFR was in Failure cases and minimum in category III.

CONCLUSIONS

Cases of category II were maximum followed by category I and II. Overall Cure rate was found 44.38% with maximum in category III and minimum in category II. Overall Defaulter rate was found 32.5% with maximum in category II and minimum in category I. Overall Failure rate was found 9.38% with maximum in category I and minimum in category III. And overall Case Fatality Rate was found 32.5% with maximum in category II and minimum in category III.This variation in treatment outcome was found significantly associated for Cure rate and CFR not for Defaulter and Failure rate. Category II cases are difficult to treat and have higher Defaulters and Case Fatality Rate so they require more attention for their follow-up and treatment.

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