

Age and Sex Profile of Tuberculosis cases and its association with treatment outcome

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Abstract— Tuberculosis affected mankind for over 5000 yrs and continue to be a major public health problem. So to generate hypothesis about tuberculosis this study was conducted to study the profile of tuberculosis cases attending at DTC Jaipur. A record based cross-sectional study of tuberculosis patients attended at District Tuberculosis Centre, Jaipur were taken. Chi-square test was used to find out association. It was found in this study that Cure Rate significantly varied with type of case, age and sex of case. It was observed highest in cat.III and below 20 yrs of age. Defaulters were max. in Relapse retreated cases and in elderly (>60 yrs.) cases whereas it was not affected significantly with age. Failure Rate was highest in category I cases and significantly varied with age and sex. About 3/4th of total deaths were observed in Failure and Relapse retreated cases. Case Fatality Rate (CFR) showed not significant variation with sex. So it can be concluded with this study that maximally affected age group with tuberculosis is either children or 40-60 years with male predominance. Category III cases are more easier to cured and Category II cases are most difficult to cured. Cure rate was lesser in 40-60 years of age group and males. Defaulters and CFR were more in category II, 40-60 year of age group and males. And Failure Rate was more in category I, 40-60 year of age group and males

Key words – DTC, Category, Cured Rate, Defaulters, Relapse, failure, CFR

1. Introduction

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 in which nation's economy depend on, so should take care of more.

India has highest TB burden of world 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. Prevalence of tuberculosis in India is 5.05%⁴

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. But there is very varied response from different parts of country about the targets.⁴⁻¹¹ So to generate hypothesis about tuberculosis, this study was conducted on tuberculosis patients attending at DTC Jaipur, which can help to understand possible reasons for this varied response.

2. Methodology

A record based case-series type of observational study was carried out in District Tuberculosis Centre (DTC) of Jaipur (Raj.). Sample size was calculated 120 subjects at 95% confidence and 1.5 absolute allowable error assuming 5% prevalence of tuberculosis(4). But to have equal representation of each

category of cases, 30 cash sheets of tuberculosis patients were chosen randomly from each category of cases came in year 2008. So total 120 case sheets of tuberculosis cases were included in the study. Records of tuberculosis patents attended at DTC of year 2008 were reviewed. All the information about tuberculosis patients with their outcome was recorded from their respective identified records. Cases transfer out and cases having incomplete case sheets were excluded from study after counting. Socio-demographic profile with clinical profile of these cases were found. 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 DOTs⁵. To find out significance of difference in proportion Chi-square test was used with the help of statistical software Primer (version 6) and 'p' value <0.05 was considered significant.

3. Results

In this present study it was observed that out of total 120 tuberculosis patients maximum 59 (49.17%) were in age group 20-40 year followed by 33.33% in <20 years, 14.17% in 40-60 years and only 3.33% in >60 years (Fig. 1) with M:F ratio 5:3 (fig 2). Category II cases included 20 (i.e. 50%) Relapse cases, 15 (37.5%) defaulter cases and 5 (12.5%) Failure cases. (Fig 3) Out of total 120 cases, 52 (43.3%) were cured and 18 (15%) were died during treatment (Fig 4). Defaulter rate of these cases was 30% and Failure rate was 8.3% (Fig 4).

Figure 1

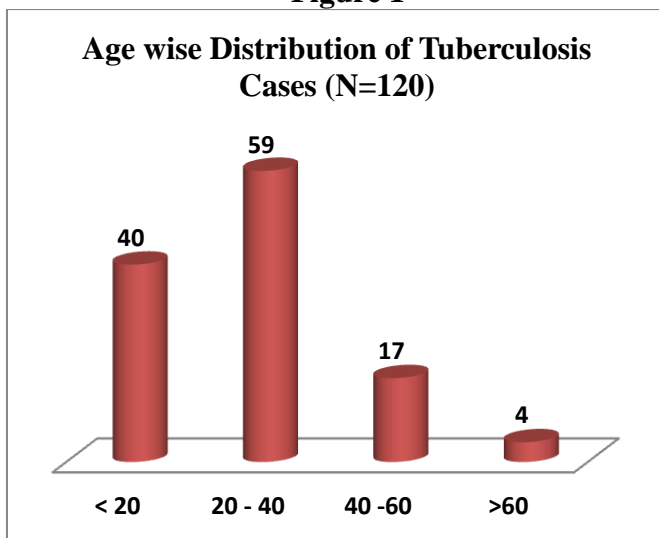


Figure 3

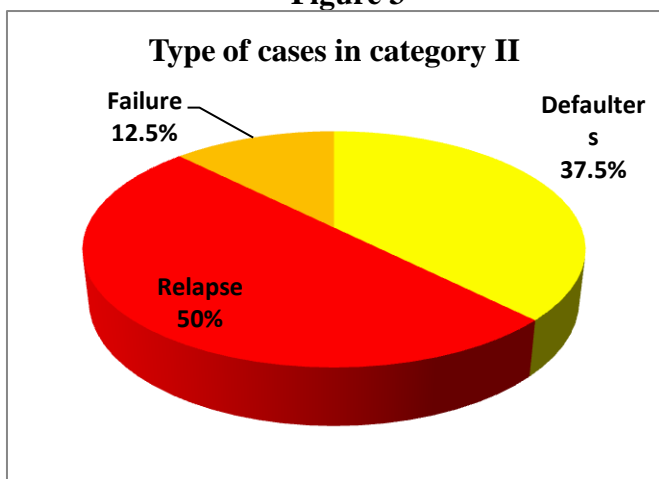


Figure 2

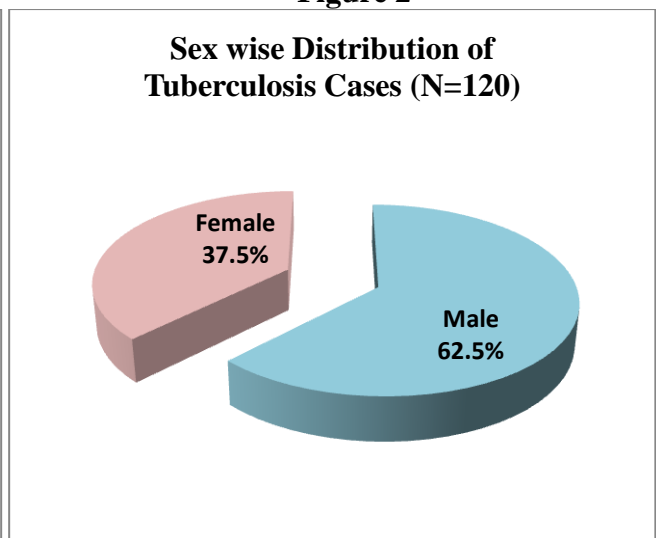
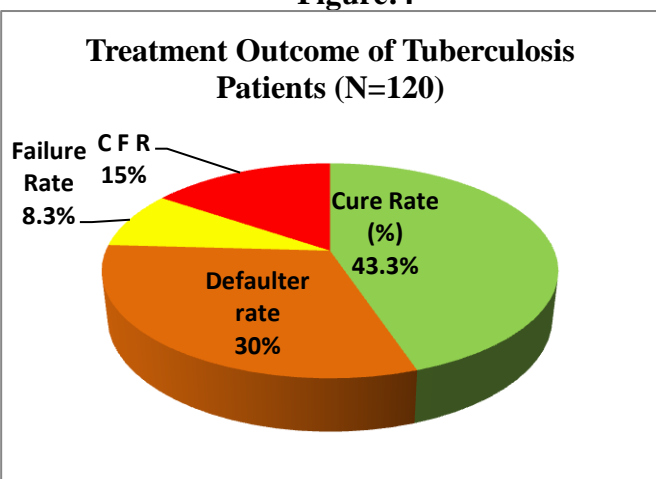


Figure:4



When treatment outcome was assessed of these cases with its associates, it was found that cure rate was maximum in category III cases i.e. 60% followed by category I and category II cases. This variation in all the treatment outcomes assessed i.e. Cure Rate, Failure Rate and CFR was found significant ($p>0.05$) except for Defaulter Rate. (Table 1)

Table 1
Treatment Outcome of Tuberculosis cases and its Associations (N=120)

	Total Cases	Cure Rate (%)	Defaulter rate (%)	Failure Rate (%)	CFR (%)
Type of Cases					
Cat I	40	42.2	30	12.5	15
Cat II	40	27.5	42.5	7.5	22.5
Defaulter	15	26.6	30	6.6	33.3
Relapse	20	30	50	10	10
Failure	5	20	40	0	40
Cat III	40	60	35	2.5	2.5
X ² Value at 2 DF		20.959	3.733	6.793	17.177
P Value LS		<0.001 S	0.155 NS	0.033 S	<0.001 S
Age – Groups					
<20	40	62.5	15	7.5	15
20-40	59	37	40.6	8.4	13.5
40-60	17	23.4	41.2	11.7	23.4
>60	4	25	75	0	0
X ² Value at 3DF		43.586	74.092	11.674	24.226
P Value LS		<0.001 S	<0.001 S	0.011 S	<0.001 S
Sex-wise					
Male	75	34.6	34.8	11.6	17.3
Female	45	57.8	28.9	2.2	11.1
X ² Value at 1DF		9.728	0.574	6.221	1.038
P Value LS		0.002 S	0.448 NS	0.013 S	0.308 NS

When treatment outcome among category II was observed, it was found that Cure rate was minimum (20%) in failure cases followed by defaulter and Relapse cases and CFR was found maximum (40%) in failure cases followed by defaulter and relapse cases. But Defaulter Rate and failure rate were found maximum in relapse cases than defaulter and failure cases. This variation of proportion of defaulter, relapse and failure cases was found significant for Defaulter Rate (Chi-square = 8.333 with 2 degrees of freedom; $P = 0.016$), Failure Rate (Chi-square = 9.852 with 2 degrees of freedom; $P = 0.007$) and Case Fatality Rate (Chi-square = 24.618 with 2 degrees of freedom; $P < 0.001$) but not found significant for Cure Rate (Chi-square = 2.760 with 2 degrees of freedom; $P = 0.252$). (Table 1)

When treatment outcome was observed as per age, it was found that Cure rate was maximum (62.5%) in <20 years of age followed by in 20-40 years, >60 years and 40-60 years of age group. Likewise Defaulter Rate, failure rate and CFR were found maximum in 40-60 years of age group. This variation was found significant for all the treatment outcomes studied i.e. Cure Rate (43.586 with 3 degrees of freedom; $P < 0.001$), Defaulter Rate (Chi-square = 74.092 with 3 degrees of freedom; $P < 0.001$), Failure Rate (Chi-square = 11.674 with 3 degrees of freedom; $P = 0.011$) and Case Fatality Rate (Chi-square = 24.226 with 3 degrees of freedom; $P < 0.001$). (Table 1)

When sex wise variation was observed in treatment outcome of cases, it was revealed that Cure rate was higher in females and Defaulter Rate, failure rate and CFR were found higher in males than females. Although this variation was found significant for Cure Rate (Chi-square = 9.728 with 1 degree of freedom; $P = 0.002$) and Failure Rate 9 Chi-square = 6.221 with 1 degree of freedom; $P = 0.013$) but not for Defaulter Rate (Chi-square = 0.574 with 1 degrees of freedom; $P = 0.448$) and Case Fatality Rate (Chi-square = 1.038 with 1 degree of freedom; $P = 0.308$). (Table 1)

4. Discussion:

In this present study maximum (49.17%) were in age group 20-40 year followed by <20 years, 40-60 years and <60 years. This study found M:F ratio 5:3. It is quoted in many studies that tuberculosis affect mainly the age group (20-60 years) on which the others are depend upon. It was also reported that tuberculosis is found predominantly in males. So observations of these studies are well comparable to other authors.

In this study among Category II cases half of cases were Relapse cases and other half includes defaulter cases (37.5%) and failure cases i.e. (37.5%) and (12.5%) respectively. Whereas

Cure Rate in this study was observed 43.3% 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 equal number of category II cases were included in this study which is higher in proportion than that in 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} These observations were further supported with finding of R.K. Mehra et all who reported Cure Rate 87.9%, 76.4% and 48.8% in category I, Relapse and Failure cases respectively.⁷ Vijay et all also observed only 39.8% Cure Rate in category II.¹⁰ K et all¹⁴ 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.

Cure Rate in this present study was (62.5%) in <20 years of age followed by in 20-40 years, >60 years and 40-60 years of age group. This may be because of the reason that < 20 years age group is under observation of their parents who are more worried about their children. It was found minimum in 40-60 years age group, who are more relaxant about their health. This fact is well supported with the finding that Defaulter Rate, failure rate and CFR were found maximum in 40-60 years of age group. And further supported that higher Cure Rate in females, who are supposed to be more sincere. In the

present study overall Defaulter Rate was observed 30% which was well comparable to observations of Vijay et al¹⁰ however Annual status report of RNTCP (2009) reported Defaulter Rate 6% India and 5% in Rajasthan respectively.⁴ This Defaulter rate was not found to be associated with category of cases but found significantly more in 40-60 years age group and in males. It may be because this group has their other priorities in this age group.

Failure Rate was observed 8.3% in the present study which is near to observations of Vijay et al (5.2%)¹¹, but was quite higher than observed by RNTCP Annual Report 2009 (2%) and other authors studies.^{4,8,9,10} Surprisingly higher Failure Rate was found in category I in present study however other studies^{4,6,9} reported higher failure Rate in category II. Likewise defaulters Failure rate was also found significantly higher in 40-60 year age group and males.

Case Fatality Rate in present study was observed 15% which was quite higher observed by RNTCP annual Status Report⁴ (4% in India and 3.6% in Rajasthan) and Vijay et al¹¹ who observed 2.2% CFR in their study. Even Karanjekar et al¹³ also reported lesser CFR (5%) in their study. Although CFR not found with significant variation as per sex but found significantly more in category II and age group 40-60 years than other counterparts. These observations regarding CFR as per category of cases were well in resonance with RNTCP annual Status Report⁴ observed maximum CFR was in Failure cases and minimum in category III.

CONCLUSIONS

Maximally affected age group with tuberculosis is either children or 40-60 years with male predominance. Category III cases are more easier to cured than others and Category II cases are most difficult to cured. Cure rate is less in 40-60 years of age group and males. Defaulters and CFR were more in category II, 40-60 year of age group and males. And Failure Rate was more in category I, 40-60 year of age group and males

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