Original Research Article

Efficacy of antitubercular drugs in Category 1 tuberculosis patients receiving daily versus intermittent regimen

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Abstract

Background: Tuberculosis is one of the major public health problem in India causing a major social and economic burden in our country.**Aims &Objective:**To compare the efficacy of antitubercular drugs in Category 1 tuberculosis patients receiving daily versus intermittent regimen. **Methods:** It was an Observational prospective study. **Material:**The present study was carried out at the department of Pharmacology, department of Pulmonary Medicine and the Microscopy cum DOTS center of SRMSIMS, Bareilly, Uttar Pradesh from 01/09/2014 to 31/05/2015. Hundred patients were selected from pulmonary medicine OPD for the study.**Results:** Out of total 100 study subjects 50 were receiving intermittent regimen as per DOTS and 50 were receiving daily regimen in OPD, difference in Sputum conversion rate at the end of intensive, non-conversion rate and default rate was not found to be statistically significant in both the groups. **Conclusion:** Both the intermittent and daily regimen showed equal sputum conversion and default rate.

Keywords: Antitubercular drugs, intermittent regimen, daily regimen, sputum.

Introduction

Tuberculosis an infectious disease caused by mycobacterium tuberculosis, now become the second leading infectious cause of death in the world [1].Tuberculosis remains a major social and economical burden in the developing countries like India. About 6 lakh deaths occur due to it in a year, which accounts to two deaths occurring every three minutes. Controlling tuberculosis in india is a tremendous challenge and the disease burden in India is still staggering[2]. People with prolonged, frequent or intense contact are at particularly high risk of becoming infected, with an estimated 22% infected rate.A person with active but untreated tuberculosis can infect 10-15 other people per year . A single patient can infect 10 or more persons in a year [3]. India, a country with over 1.21 billion people, accounts for 20% of the global incidence of tuberculosis ,thus sharing the highest burden of TB among the countries in the world [4]. The Revised National Tuberculosis Control Programme was piloted in 1993 and was based on DOTS, which was the internationally recommended strategy for TB control promoted diagnosis by sputum smear microscopy, direct observation of treatment,standardized regimens, recording and reporting of notified cases and treatment outcomes and over and above all political commitment [5].The key component of DOTS therapy is the standard anti tuberculosis short course chemotherapy regimens ,which require continually taking drug combination of isoniazid(INH) rifampicin (RFP) pyrazinamide (PZA) ethambutol (EMB) and streptomycin(SM) every other day for 6-9 months [6].Unfortunately, even with the introduction and the functioning of DOTS in India for more than a decade, tuberculosis is still one of the leading causes of mortality in India (two persons in every three minutes, nearly 1000/day) [7]. The number of new smear positive cases has increased from 28/1,00,000 population in 1997 to 41/1,00,000 population in 2003 [4]. The WHO revised the situation, it published a guideline in 2010 and recommended that wherever feasible, in the daily regimen can be initiated [8]. So in order to clear the confusion that which regimen is better we have planned this study.

Aim & Objectives

1. To find out the treatment outcome in both the regimens
2. To know the sputum conversion rate in both the groups
3. To assess the default rate in both the groups

Material & Methods

The present study was carried out at the department of Pharmacology, Department of Pulmonary Medicine and the Microscopy cum DOTS center of SRMSIMS, Bareilly, Uttar Pradesh from 01/09/2014 to 31/05/2015. In this observational study, all registered patients who were diagnosed as Category 1 Pulmonary tuberculosis were selected for the study. Total 100 patients were selected, out of which 50 were receiving intermittent regimen as per DOTS (Group 1) and other 50 were getting Daily regimen (Group 2) in OPD basis. Findings were analyzed statistically to know the outcome of treatment of tuberculosis in both the groups and within the group too. Efficacy of drugs and compliance of patients are also assessed and compared in both the groups. Patients attending the Out Patient Department(OPD) of Pulmonary Medicine and those referred to Microscopy cum DOTS center were the source of study material.

Inclusion Criteria:Patients between the ages of 15 and 80 years with Tuberculosis, who were taking treatment under DOTS in category 1 of RNTCP regimens and category 1 of tuberculosis patients attending OPD of pulmonary medicine. Diagnosis of Tuberculosis was established on the basis of clinical history and examination, sputum examination and X-ray chest and other relevant investigations.

Exclusion Criteria:

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- Category 2(previously treated) cases including MDR case and XDR cases.
- Previously existing severe disease.
- History of recurrent psychotic disorders, alcohol or drug abuse within the previous year.
- Current cardiac, renal or hepatic dysfunction.
- Pregnant and lactating women were also excluded from study.

All the information was collected on a pretested questionnaire, patients were clinically evaluated and examined for their response on everymonth and advised to visit any time if they develop any untoward-reaction or severe problems during treatment.

Outcome of treatment was seen in theform of:-

- Cured
- Relapse
- Treatment failure
- Defaulted
- Alteration in therapy
- Died
- Any other

Effects of ATT drugs in both the regimens were judged by sputum conversion rate at the end of intensive phase in both the groups and compliance of patients was judged by defaulters' rate.

Ethical Clearance

Ethical clearance was taken from Institutional Research Committee & Institutional Ethical Committee

Results

In the present study a total no. of 100 patients of tuberculosis attending the outpatient department (OPD) of Pulmonary Medicine department at SRMSIMS, Bareilly was included.

Among them group 1 consists of those study subjects who were receiving intermittent therapy as per DOTS and group 2 were receiving daily regimen on OPD basis.

Table 1 & Table 2: These tables show the age group and sex wise distribution of study subjects in both the groups.Majority of participants were in the age group of >35 upto 50 years 54% in group 1 and 52% in group 2. Male forms the majority of the study participants in both the groups 58% in group 1 and 72% in group 2.

Table 1: Age group wise distribution in both study subjects group

Age group(in years)	**Group I(n = 50)**	**Group 2(n=50)**	**Total(n=100)**
20 upto 35	18 (36 %)	16 (32 %)	34
>35 upto 50	27 (54 %)	26 (52 %)	53
>50 upto 80	05 (10 %)	08 (16 %)	13

Table 2: Sex wise distribution in both study subjects group

Sex	**Group 1(n = 50)**	**Group 2(n=50)**	**Total(n=100)**
Male	29 (58%)	36 (72%)	65
Female	21 (42%)	14 (28%)	35

Table 3: This table shows the treatment outcome in both the groups. Treatment outcome was assessed on the basis of cure, relapse, failure, default and alteration in therapy rates. Cure rate was 68% and 72% in group 1 and group 2 respectively.Z test was applied to see difference in both the groups was significant or not, it was seen that there was no difference in treatment outcome in both the groups as the p value is >0.5 in all the parameters for treatment outcome.

Table 3: Treatment outcome in both groups

Type of outcome of treatment	**Group 1(n=50)**		**Group 2(n=50)**		**Z value(95% C.I)**	**P value**
	No.	%	No.	%		
Cured	34	68	36	72	0.43	p>0.05
Relapse	6	12	4	8	0.66	p>0.05
Failure	2	4	1	2	0.58	p>0.05
Default	5	10	7	14	0.95	p>0.05
Alteration in therapy	3	6	2	4	0.45	p>0.05

Table 4: This table shows the treatment outcome in different age groups. Cure rate was highest (85.29%) among age group of 20-35 years and lowest (53.84%) in 50-80 years of age. Failure, default and alteration in therapy rate were highest among 50-80 years of age group and lowest in 20-35 years of age group. Relapse rate was highest in 35-50 years of age group lowest in 20-35 years of age group. Overall treatment outcome was best in 20-35 years of age group.

Table 4: Treatment outcome among different age groups

Outcome of treatment	**20 upto35 years**		**>35 upto50 years**		**>50 upto80years**		**Total**	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Cured	29	85.29	34	64.15	7	53.84	70	70.00
Relapse	2	05.89	7	13.20	1	07.69	10	10.00
Failure	0	0.00	2	03.77	1	07.69	3	3.00
Default	2	05.89	7	11.32	3	23.07	12	11.00
Alteration in therapy	1	02.94	3	05.66	1	07.69	5	5.00
Total	34	100.00	53	100.00	13	100.00	100	100.00

Table 5: This table compares the effects of drugs in both the groups.Sputum conversion rate at the end of intensive phase (attainment of sputum smear negativity) was more in group 1 (86%) than group 2 (78%) but this difference was found to be statistically not significant (p value >0.5). default rate was found to be higher in group 2 (14%) as compared to group 1 (10%) but this difference was also not found to be statistically significant (p value >0.5).

Table 5: Comparison of effects of drugs between both the groups

Sputum conversion rate	**Group1**	**Group2**	**Z value**	**P value**
Sputum conversion rate at the end of intensive phase	43(86%)	39(78%)	1.04	>0.05
Non conversion	02(4%)	04(8%)	0.39	>0.05
No. of default	05(10%)	07(14%)	0.95	>0.05

Discussion

Tuberculosis (TB) is a major public health problem across the globe particularly in India. In 1998 the global TB program of WHO established Global TB Research Initiative to support related research. Research has been done by NGOs on health system & Service Research that included studies on DOTS by community health workers, on microscopic diagnosis and drug resistance surveillance.In our study, males constitute the larger proportion that is 65% and females constitute 35%. This is in accordance with Sinha et al., [9] and Mandal et al.,[10] who also found 76.47% males against 25.53% females and 3.3:1 ratio respectively. Maximum patients belonged to age group of 35-50years (53%) followed by 20-35 years in our study, Sinha et al., [9]also found TB to be more prevalent in 31-40 years(27.45%) while in Mandal et al.,[10]&Chhetri et al.,[11] study age group 21-40 years (39.54%) constituted major group having patients.In our study, most of the patients completed treatment with 68% (intermittent) & 72% (daily) declared cured, only 8% defaulters (intermittent group) and 7% in daily treatment group 2 & in 1 patient in intermittent group, treatment has to be withdrawn. Differences between the two groups were not statistically significant.Chennaveerappa P K et al.,[12] found 84% cure rate among new sputum smear positive getting DOTS intermittent therapy and default rate was 8%, similar finding was found by Taher M et al., [13] 92% was treatment success rate and default rate was 7%.In present study, alteration of therapy was required 6% in group 1 and 4% in group 2 patients and the difference between the two was not statistically significant ($p>0.05$). Ormerod et al.,[14] in 1996 had reported that modification was required in 5.1% of cases.Regarding efficacy of drugs in both the groups, sputum microscopy was analyzed at the end of intensive phase for each patient. Sputum conversion rate (attainment of sputum smear negativity) was numerically higher in intermittent group (86%) as compared to daily treatment group (78%) but this difference was not statistically significant ($p>0.05$). These findings were in accordance with study done by Kashyap et al.,[15] 2009 where it was 79.8% in DOTS group. Qayyum et al.,concluded that sputum conversion rate at the end of intensive phase was 83% in intermittent group while it was 80% in daily treatment group.

Limitations

- Study was done on small group of patients in one tertiary care centre, more fruitful results canbe obtained by doing large multicentre study.
- Only the initial intensive phase was considered in the study, but the efficacy of a regime is judged not only by the sputum conversion rate, but also by the relapse rate.

Conclusion

Regarding efficacy of AntiTB drugs in regimens used in group 1 & 2, sputum negativity rate at the end of intensive phase is not significantly different in two groups suggesting almost equal efficacy of drugs in both the regimes There is no significant difference in outcome of treatment between the two groups. Defaulters are more in group 2(14%) as compared to group 1(8%).

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