

## REASONS FOR INTERRUPTION OF ANTI-TUBERCULAR TREATMENT AS REPORTED BY PATIENTS WITH TUBERCULOSIS ADMITTED IN A TERTIARY CARE INSTITUTE

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### Summary

**Setting:** Department of Tuberculosis and Chest Diseases, Tertiary Level tuberculosis (TB) institute in Delhi, India.

**Objective:** To study the reasons for interruption of Anti-Tubercular Treatment (ATT) as reported by tuberculosis patients admitted at LRSI.

**Design:** Retrospective cohort-based analysis.

**Results:** A total of 201 patients were enrolled (179 of pulmonary tuberculosis, eight of extra-pulmonary tuberculosis and fourteen of both pulmonary as well as extra-pulmonary tuberculosis); who had interrupted treatment 327 times. Maximum interruptions (72.17%) were found to occur by third month of ATT. More than one reason was often reported for discontinuation of treatment. In all, 366 responses were obtained from 201 patients, in response to reasons for treatment interruption. The rate of treatment interruption was higher in the private health sector (56.27%), as compared to DOTS (34.25%) and other sources of treatment (9.48%). Early improvement (30.05%) and high cost of treatment (16.39%) were found to be the two most common reasons, leading to treatment interruption.

**Conclusion:** Early improvement and high cost of treatment were found to be the two most common reasons, leading to treatment interruption. Continuous health education should be provided to all tubercular patients emphasizing the need to continue treatment despite early improvement in symptoms. [*Indian J Tuberc* 2011; 58: 11-17]

**Key words:** Tuberculosis, Treatment interruption, Anti-Tubercular Treatment (ATT).

### INTRODUCTION

Tuberculosis affects one third of the world's population<sup>1</sup>. It remains a major public health problem in the world with approximately 9.27 million new cases reported in 2007 and around 1.7 million deaths occurring each year<sup>2</sup>. India alone accounts for one-fifth of the world's new TB cases<sup>1</sup>.

Under India's previous National Tuberculosis Programme (NTP), treatment completion rate of only 30 per cent could be achieved<sup>3</sup>. Since the programme was not DOT based, adherence to treatment remained a serious problem<sup>3</sup>. Chatterjee *et al*<sup>3</sup> estimated that 70 to 90 per cent of patients failed to take their drugs regularly. Revised National Tuberculosis Control Programme (RNTCP) was designed in 1992 to overcome the drawbacks of NTP. However, interruption in tuberculosis treatment still remains the major barrier to its control and is the most

important challenge for control of TB. Inability to complete the prescribed regimen, is an important cause of treatment failure, relapse, acquired drug resistance and continuous transmission of infection.

Adherence to the long course of TB treatment is a complex, dynamic phenomenon with a wide range of factors impacting on treatment-taking behaviour. Many studies have been conducted across the world to study the reasons for default from ATT<sup>4-6</sup>, and some are also reported from India (mostly done under RNTCP setting)<sup>23-26</sup>. The objective of this study was to study the reasons for discontinuation of Anti-Tubercular Treatment (ATT) among patients admitted in an Institute catering to a heterogeneous population.

### METHODS

The present study was conducted over a six month period from May to October 2007, and

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consisted of an analysis of the data of pulmonary as well as extra-pulmonary TB patients admitted at LRS Institute of Tuberculosis and Respiratory Diseases, New Delhi during the said period. Ethical approval was taken and patients were interviewed using a semi-structured questionnaire after obtaining consent. Information recorded in the questionnaire included personal data, socio-demographic data, past and present history of ATT, sputum and X-ray results, and reasons for discontinuation of ATT. Data were analysed using Microsoft Excel and percentages were calculated and applied.

All TB patients admitted to the Institute during this period were interviewed regarding the past history of ATT and whether they had ever interrupted their treatment for two months or more anytime. For the purpose of this study, any patient suffering from TB (PTB/EPTB) at the time of interview, and also with a past history of treatment default was said to have interrupted treatment, which was defined as ATT intake of more than a month, with a gap of more than two months between two courses of ATT.

Patients who gave a history of treatment interruption as defined above were enrolled for the study. All these patients were then interviewed in detail using a pre-tested semi-structured questionnaire. The questionnaire was initially pre-tested in fifteen patients. In addition to the personal and socio-demographic data, treatment history was recorded in detail.

The recall period (from time of first treatment interruption to the time of interview) in this study, was lengthy in some patients, especially for those who had taken ATT more than twice in the past.

## RESULTS

A total of 2505 patients were admitted to LRS Institute during the study period. Among them, 1488 patients suffered from Tuberculosis. Among the 1488 TB patients, 201 (13.51%) were found to have a past history of ATT interruption and were included in the study. 179 (89.05%) suffered from

Pulmonary Tuberculosis, eight were cases of extra-pulmonary Tuberculosis (EPTB); while 14 had both pulmonary as well as extra-pulmonary tuberculosis.

Among the 201 patients interviewed, 156 (77.61%) were males and 45 were females. The highest number of treatment interrupters were in the age group 25 to 44 years (n=116), constituting nearly 57% of all the patients studied, while only 1.49% were below 15 years of age.

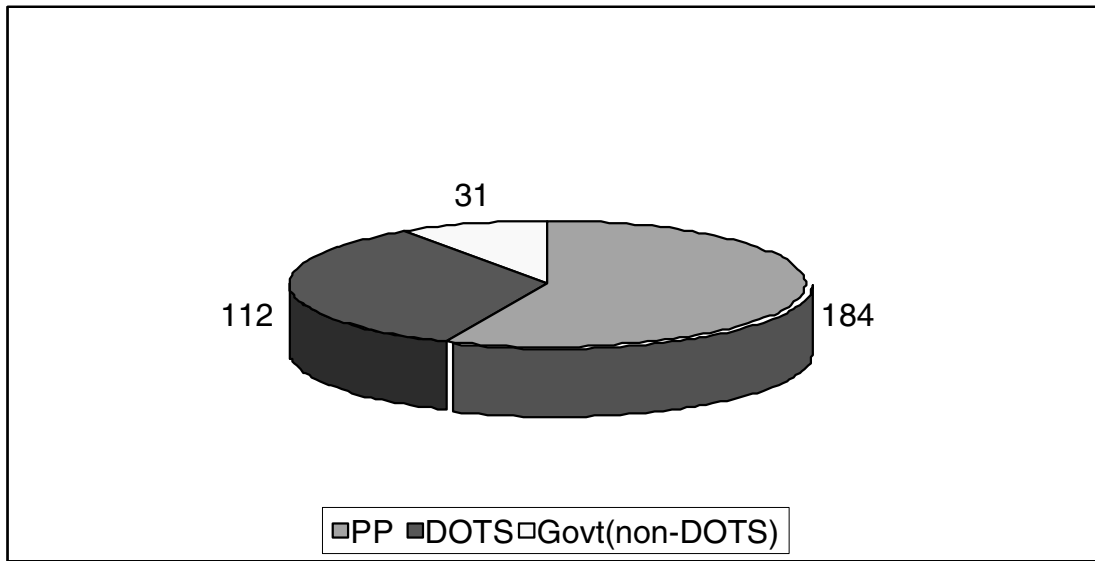
Of the 201 patients interviewed, 107 belonged to Delhi, while remaining 94 had come to LRS Institute from outside Delhi. 62 (30.85%) of the patients studied had been ill for only six months, while other patients had been ill for a longer duration, with nine (4.48%) patients having been ill for more than five years. 57.71% (n=116) patients were smokers among which 56.03% (n=65) had a smoking index of < 300, 12.93% (n=15) had a smoking index between 300 – 400 and 36 patients (31.03%) had a smoking index of >400. Almost half [49.25% (n=99)] of the patients interviewed had a history of alcohol intake.

179 of the patients interviewed had no comorbidities. Among the remaining, nine had Diabetes, two had co-existing Hypertension and other comorbidities were present in 11 patients.

Among the 201 patients enrolled, 42 (20.9%) were unmarried, 145 (72.14%) were married, 12 were widowed, while two were divorced. 58 (28.86%) patients had a family history of TB. 92 (45.77%) patients were residents of urban areas, while the other 109 (54.23%) patients used to reside in rural areas.

Among the 201 patients interviewed, 115 (57.21%) had interrupted treatment only once, while 59 (29.35%) had interrupted treatment twice; and remaining patients had interrupted treatment more than two times. Thus, the 201 patients included in the study had interrupted treatment 327 times.

Among the 327 treatment interruption episodes, 184 (56.27%) occurred when the prescribing source was a private practitioner, 112



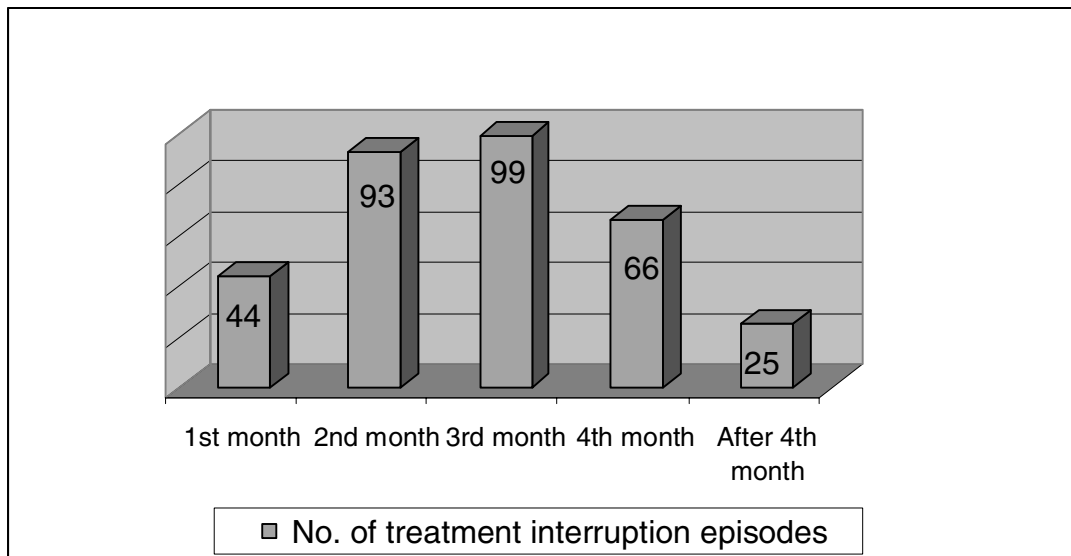
**Fig. 1:** Source of ATT among patients who interrupted treatment (n = 327)

(34.25%) took place while on treatment under DOTS, and remaining 31 (9.48%) interruptions took place while on non-DOTS treatment from a Government source (Figure 1).

Seventy-two percent of patients had stopped treatment by the end of third month of

treatment. Maximum interruptions were found to occur between second and third months (Figure 2).

Among the 201 patients interviewed, 81 (40.3%) stated only one reason for interrupting their treatment. An equal number of patients stated two reasons, while 33 (16.42%) and six (2.99%) gave



**Fig. 2:** Time of treatment interruption (n=327)

**Table 1:** Reasons for treatment interruption (n=366)

S. No.	Reasons for treatment interruption	No. of Patients who interrupted treatment	%age (n=366)
1.	Early improvement	110	30.05
2.	High cost of treatment	60	16.39
3.	ATT-induced side effects	47	12.84
4.	Unaware about long duration of treatment	33	9.02
5.	No improvement/ deterioration	26	7.10
6.	Alcoholism	16	4.37
7.	Advised to stop treatment by Physician	15	4.10
8.	Others	59	16.12
	<b>TOTAL</b>	<b>366</b>	

**Table 2:** Other reasons for treatment interruption (n=59)

S. No.	Other Reasons		No. of Patients	%age (n=59)
1.	Lack of Faith in treatment		10	16.95
2.	DOTS related	Long Distance travel to Centre	14	23.73
3.		Missing of work	4	6.78
4.		Shortage of medicines at Centre	6	10.17
5.		Refused treatment by health worker	3	5.08
6.		Personal/ family reasons	Family problems	5
7.	Went to village		13	22.03
8.	Non-compliant attitude		2	3.39
9.	Change of address		2	3.39
	Total		59	

three and four reasons respectively. Thus, 366 responses for treatment interruption were obtained from 201 patients. The most common reason stated was a feeling of early improvement (30.05%), followed by high cost of treatment (16.39%) and ATT-induced side effects (12.84%). (Table 1)

Among the various ATT-induced side effects (n=47), the most commonly reported side effect was nausea and vomiting (53.19%), followed by restlessness (14.89%), next being ATT-induced skin rash (n=6), drug-induced hepatitis (n=5); hearing loss (n=2), nephrotoxicity (n=1) and seizures (n=1).

Fifty-nine (16.12%) patients cited other reasons to be responsible for their treatment interruption. Other reasons being lack of faith in treatment (n=10); DOTS – related (n=27); and personal or family reasons (n=22). (Table 2)

## DISCUSSION

This was an interview based analysis of the reasons for ATT interruption as reported by tuberculosis patients admitted to LRS Institute between May 2007 and October 2007. Among the 1488 TB patients admitted during the study period, 201 (13.51%) had a history of treatment interruption, of which 89.05% patients had pulmonary tuberculosis.

In this study, out of 327 treatment interruptions, 184(56.27%) interruptions occurred on private treatment, while 34.25% interruptions took place on DOTS; and remaining 9.48% treatment interruptions occurred on non-DOTS Government treatment. This emphasizes the need to provide DOTS to all as it is the only way to minimize treatment interruption.

In our study, 72% patients had interrupted treatment by the end of third month; and maximum (30.28%) interruptions were found to occur between second and third months. Other studies have also reported that maximum number of patients interrupted their treatment by the end of second or third month. Kaona *et al*<sup>7</sup> reported up to 39% patients stopped taking their medication within the first two

months of commencing treatment; while Chan-Yeung *et al*<sup>8</sup> found that 45% of those who defaulted did so in the first two months of treatment. Oliviera *et al*<sup>9</sup> from Brazil have found that 43.3% of the defaulters, stop treatment in the first two months of treatment. On the contrary, some investigators have reported higher default rate after third month of ATT. Dodor *et al*<sup>10</sup> have determined the mean defaulting moment to be 3.4 months. Tekle *et al*<sup>11</sup> found defaulting to be the highest (81%) during the continuation phase of treatment. In a case control study by Demissie *et al*<sup>12</sup>, most of the defaults occurred in the third and fourth months of treatment. Chee *et al*<sup>13</sup> have stated that 70% patients defaulted during the continuation phase of treatment.

When trying to assess the reasons for treatment interruption, 366 responses were obtained. The most common reason was a feeling of early improvement as stated by 110 patients (30.05%). Kaona *et al*<sup>7</sup> also found that 29.8% of TB patients failed to comply with ATT once they started feeling better. Social problems and feeling of improvement were the top two reasons for patients to default in study by Demissie *et al*<sup>12</sup>. In another survey by Tissera<sup>14</sup> at Colombo Chest Clinic, relief from symptoms (13%) emerged as the most common reason for treatment interruption. However, in a study by Jaggarajamma *et al*<sup>15</sup>, relief from symptoms was found to be the third commonest reason for discontinuation of treatment (20%).

As interruption frequently occurs at the third month of treatment, which coincides with clinical improvement and early improvement is the commonest reason, it is imperative to provide repeated health education to patients emphasizing the need to continue treatment despite improvement.

The next most common reason was high cost of treatment cited by 60 (16.39%) patients in our study. This was exclusively reported by patients who had interrupted ATT from non-DOTS sources as they had to purchase their medicines from the market. It is thus necessary to incorporate all TB patients for treatment under DOTS, so as to reduce the number of interruptions occurring due to high

cost of treatment. To achieve this, public-private mix is a must.

ATT-induced side effects leading to treatment interruption ranked as the third commonest reason, in the present study, stated by 47 (12.84%) patients. In a study from Tiruvallur district, South India, Jaggarajamma *et al*<sup>15</sup> have found drug related problems to be the leading cause of treatment interruption in 42% patients. Similarly, Wares *et al*<sup>16</sup> found the most common reason for stopping treatment being the adverse effects of ATT.

Thirty-three (9.02%) patients said that they interrupted treatment as they were unaware about the long duration of treatment. In a study by Bam *et al*<sup>17</sup> from Kathmandu, 61% non-adherent patients claimed insufficient knowledge about the need to continue treatment, especially after they felt better.

Twenty-six (7.1%) patients stopped taking their drugs as they were unable to appreciate any improvement or felt they were deteriorating. Sixteen (4.37%) patients blamed alcoholism as the reason for their treatment interruption. In a study from the Russian Federation, Jakubowiak *et al* (2007)<sup>18</sup> have found alcohol use to be the second commonest reason (30%) for treatment default.

Fifteen patients in our study said that their treating physicians had advised them to stop their treatment. Fifty-nine (16.12%) patients cited other reasons to be responsible for their treatment interruption. Among DOTS related other reasons, 14 patients had interrupted treatment due to long distance of travel to their DOTS centre. In a study by Chatterjee *et al*<sup>3</sup>, the most common reason for treatment interruption was distance from the treatment centre. Many studies have demonstrated the indirect costs of treatment to be responsible for treatment interruption. In the pre-Rifampicin era, Pathak<sup>19</sup> reported that many patients defaulted if visit to the clinic involved loss of wages. Similarly, Mishra *et al*<sup>20</sup> reported that the risk of non-adherence to treatment was significantly associated with cost of travel to the TB treatment facility. In a study by O'Boyle *et al*<sup>21</sup>, cost of transport was the reason

most frequently given for non-attendance at DOTS centre. Hill *et al*<sup>22</sup> have reported a higher default rate among those who incurred significant time or money costs travelling to receive treatment.

## CONCLUSIONS

**Maximum interruptions were found to occur by third month of ATT. Multiple treatment interruptions were common. More than one reason was often reported for discontinuation of treatment. The rate of treatment interruption was higher in the private health sector, as compared to DOTS and other sources of treatment. Early improvement and high cost of treatment were found to be the two most common reasons, leading to treatment interruption.**

**The need for direct supervision of treatment and continuous health education emphasizing the need to continue treatment despite early improvement cannot be over-emphasized. Default occurring due to early improvement also calls for the introduction of drugs that would further shorten the duration of chemotherapy. Also the number of DOTS centres should be increased so that it comes within reach of everyone.**

## LIMITATIONS

1. This is a hospital based study and not a field study; therefore the results may not be reflective of reasons for treatment interruption in the community.
2. The study is interview-based and documents were not always available, so there could be error in reporting of events from patient's side. Also, for some patients, the recall period was six to seven years.
3. Due to lack of control group in the study, statistical tests could not be applied.
4. As the study was conducted at a tertiary referral hospital, where patients usually present with advanced disease or complications, the results may not be applicable to the general population suffering from T.B.

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