

Original Research Article

Impact of anti-tubercular treatment on weight and symptoms of category I tuberculosis patients in an urban city of central India

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ABSTRACT

Background: Sputum conversion and weight gain are prognostic markers of treatment outcome in tuberculosis (TB) patients. Very few studies in India have assessed impact of TB treatment on weight of patients and perceived improvement in symptoms. This prospective study aimed to assess the impact of anti-tubercular treatment on weight and perceived symptoms.

Methods: Three interviews were done for each patient i.e. at start (within 7 days of starting anti-tubercular treatment), at the end of intensive phase and at the end of continuation phase for recording body weight and perceived symptoms. Descriptive statistics were used to summarize baseline characteristics. Mean scores at different stages of treatment were compared by repeat measure ANOVA. $P < 0.05$ was considered to be statistically significant.

Results: Out of 58 study subjects enrolled for the study, 53 could be followed up till the end. Mean weight improved in six months of anti-tubercular treatment. Improvement was statistically non-significant. Cough and fever were the most common symptoms prior to beginning of treatment. After the first 2 months the proportion of subjects with symptoms declined for all five symptoms i.e. fever, cough, chest pain, sweats, and dyspnoea.

Conclusions: There was positive impact on weight gain in patients under category I treatment. The symptoms improved drastically in first two months with near complete resolution in six months of treatment.

Keywords: Tuberculosis, Symptoms, Weight gain, Central India

INTRODUCTION

Tuberculosis (TB) is a worldwide, chronic communicable bacterial disease. It is a disease of poverty affecting mostly young adults in their most productive years. The vast majority of TB deaths are in the developing world.¹

TB is the ninth leading cause of death worldwide and the leading cause from a single infectious agent, ranking above HIV or AIDS. In 2016, there were an estimated 1.3 million TB deaths among HIV-negative people (down from 1.7 million in 2000) and an additional 374 000 deaths among HIV-positive people. An estimated 10.4 million people fell ill with TB in 2016: 90% were adults,

65% were male, 10% were people living with HIV (74% in Africa) and 56% were in five countries: India, Indonesia, China, the Philippines and Pakistan.² Most deaths from TB can be prevented with early diagnosis and appropriate treatment. Millions of people are diagnosed and successfully treated for TB each year, averting millions of deaths (53 million 2000-2016), but there are still large gaps in detection and treatment.² Most of the estimated number of incident cases in 2016 occurred in the World Health Organization (WHO) South-East Asia region (45%), the WHO African region (25%) and the WHO Western Pacific region (17%); smaller proportions of cases occurred in the WHO Eastern Mediterranean region (7%), the WHO European region (3%) and the

WHO region of the Americas (3%).² India accounts for one fourth of the global TB burden. The burden of TB has very significant social, economic and health related implications for such patients, their families, and the communities affected by TB.³

It appears that for a thorough assessment of patients' health status, it is essential to consider the overall impact of TB on health and patients' perception of improvement in symptoms, apart from clinical, radiologic, and bacteriological assessments.⁴ However, to our knowledge very few studies in India have assessed impact of TB treatment on weight of patients and perceived improvement in symptoms. This study aimed to measure the impact anti-tubercular treatment on weight and perceived symptoms in category (CAT) I tuberculosis patients.

METHODS

Present prospective observational study was conducted in Revised National Tuberculosis Control Program (RNTCP) CAT I pulmonary tuberculosis patients in a tuberculosis unit of Nagpur to assess the impact of anti-tubercular treatment on weight and perceived symptoms. The data was collected from August 2016 to August 2017. The necessary permission for carrying out the study was obtained from district tuberculosis officer after apprising him about the nature and purpose of the study. All newly diagnosed new smear positive pulmonary tuberculosis adult patients who attended Directly Observed Treatment Short-course (DOTS) centres under given tuberculosis unit were consecutively enrolled for the study until sample size was met. Patients suffering from extrapulmonary TB, CAT II TB patients, HIV positive patients, known case of hypertension, diabetes, other chronic conditions and study subjects in whom intensive phase treatment was prolonged were excluded from study. After obtaining the necessary consent and explaining the nature and purpose of the study, data was collected during OPD hours, in a separate room at suitable timings convenient to patients in order to seek their maximum co-operation. Information regarding socio-demographic characteristics like age, gender, socioeconomic status, and patient's educational and occupational status, and father's educational and occupational status, total monthly income was recorded in proforma by face to face interview with the patient. Body weight was measured in light clothing, without shoes to the nearest 0.1 kg using the electronic weighing machine. Information regarding presence of following symptoms were recorded. Fever, cough, chest pain, dyspnoea, sweats. A total of three face to face interactions were done for each patient i.e. first at the start of anti-tubercular treatment (ATT), second, at the end of intensive phase and third, at the end of continuation phase. Body weight and information about presence of symptoms were recorded at each follow up.

Statistical analysis

Data was entered in excel and analyzed using statistical software Epi Info 7. Descriptive statistics (percentage, mean, standard deviation, range) were used to summarize baseline characteristics of the study subjects. Mean scores of patients at different stages of treatment were compared by Repeat measure ANOVA. Association between two categorical variables was analysed by using Fisher's exact test. $P < 0.05$ was considered to be statistically significant.

RESULTS

A total of 58 study subjects were enrolled for the study out of which 53 could be followed up till the end of study. Out of 53 study subjects, 42 (79%) were males and 11 (21%) were females. Maximum 15 (28.3%) study subjects belonged to age group of 41 to 50 years followed by 11 (20.75%) in age group 21 to 30 years. Mean age was 39.15 ± 13.29 years. Range was 18 to 76 years. In Table 1, majority 34 (64.2%) of study subjects were married. 16 (30.2%) were unmarried followed by 1 study subject each living as married, separated, and widower. None of the study subjects were divorced or widowed. Majority 17 (32.1%) of study subjects were educated up to middle school certificate. It was followed by 14 (26.4%) study subjects educated up to post high school diploma, 9 (17%) till high school certificate, 6 (11.30%) till primary school certificate. Only 4 (7.5%) were graduates. Very few 3 (5.70%) were illiterate. Maximum number of participants (35.8%) were unskilled workers followed by semiskilled worker (18.9%), 22 (41.50%) were belonging to class III followed by 20 (37.7%) to class II. 11 (20.75%) were belonging to class IV while none of the study subjects belonged to class I and class V. Mean weight improved in six months of ATT treatment in this study, however the improvement continued to be non-significant. Cough and fever were the most common symptoms prior to beginning of Anti tubercular treatment. At baseline mean weight of all study subjects was 41.17 ± 7.91 which improved to 42.42 ± 7.58 at two months and 43.60 ± 8.78 at six months. Overall there was improvement in mean weight of study subjects however this change was not significant (Table 2).

Table 1: Age wise distribution of study subjects.

Age (in years)	Study subjects	
	No.	%
<20	6	11.32
21-30	11	20.75
31-40	11	20.75
41-50	15	28.30
51-60	8	15.09
>60	2	3.77
Total	53	100

Table 2: Assessment of weight.

	At baseline (Mean±SD)	At 2 months (Mean±SD)	At 6 months (Mean±SD)	P value
Weight (Kg)	41.17±7.91	42.42±7.58	43.60±8.78	0.306 df: 158

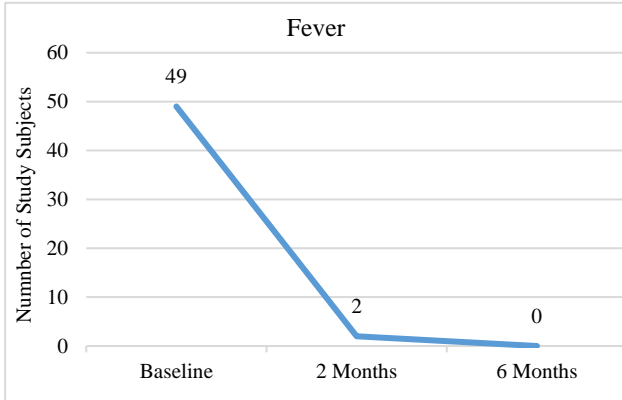


Figure 1: Number of study subjects with fever during six months.

At baseline 49 (92.4%) study subjects perceived fever while at two months only 2 (3.7%) study subjects perceived fever. At six months, none of the study subjects reported fever (Figure 1).

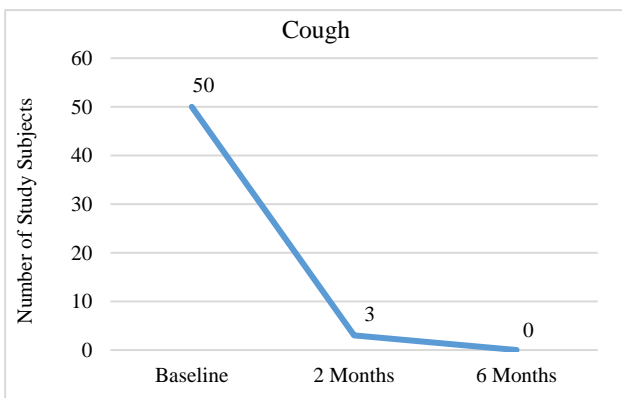


Figure 2: Number of study subjects with cough during six months.

At baseline 50 (94.3%) study subjects perceived cough while at two months only 3 (5.6%) study subjects perceived cough. At six months, none of study subjects complained of cough (Figure 2).

At baseline 12 (22%) study subjects perceived dyspnoea while at two months 7 (13.2%) study subjects perceived dyspnoea and ultimately at six months only 2 (3.7%) study subjects complained of dyspnoea (Figure 3). At baseline 10 (18.8%) study subjects perceived chest pain while at two months only 3 (5.6%) study subjects perceived chest pain and ultimately at six months only 1 (1.8%) study subject complained of chest pain (Figure 4). At baseline 34 (64%) study subjects perceived sweating

while at two months only 3 (5.6%) study subjects perceived sweating and ultimately at six months only 1 (1.8%) study subject perceived sweating (Figure 5).

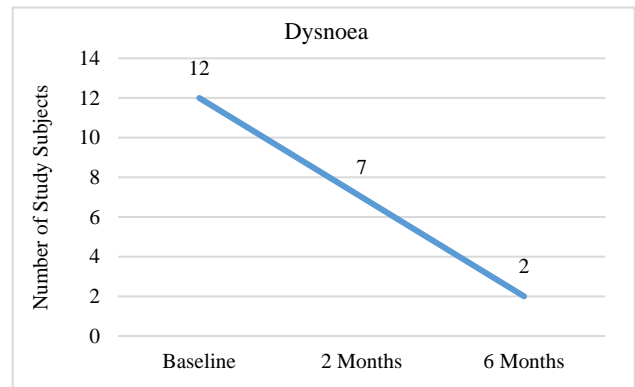


Figure 3: Number of study subjects with dyspnoea during six months.

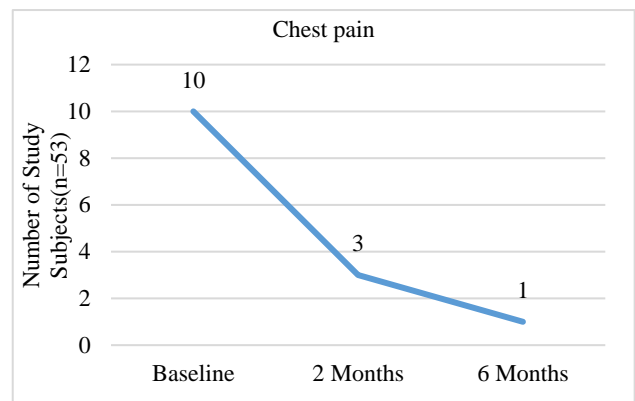


Figure 4: Number of study subjects with chest pain during six months.

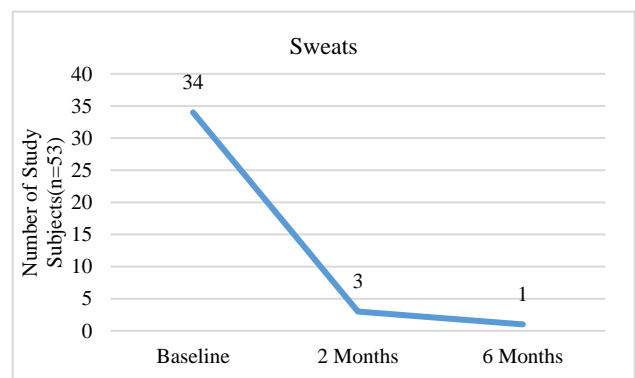


Figure 5: Number of study subjects with sweats during six months.

DISCUSSION

In the present study at baseline mean weight of study subjects was 41.17 ± 7.91 which improved to 42.42 ± 7.58 at two months and 43.60 ± 8.78 at six months. Mean weight in study by Balgude et al was 53.56 ± 3.41 .⁴ Present study reported overall improvement in mean weight of study subjects however this change was not significant. Most of the weight gain occurred in first two months. Similarly, in study by Hoa et al most of the weight gain occurred in first two months.⁵ In study by Bernabe Ortiz et al mean weight at baseline was 54.7 ± 8.3 which improved to 56.8 ± 8.5 at 2 months and finally 58.7 ± 8.7 .⁶ This weight gain was non-significant. Phan et al reported that at baseline the mean weight was 63.9 ± 1.4 which improved to 65.1 ± 1.7 and later at 6 months to 68.1 ± 1.4 .⁷

In our study, at baseline 49 (92.4%) study subjects perceived fever, 50 (94.3%) study subjects perceived cough, 12 (22%) perceived dyspnoea, 10 (18.8%) perceived chest pain, 34 (64%) study subjects perceived sweating. In study by Bark et al percentage of subjects with self-reported symptoms at baseline ranged from 30% for dyspnoea to 81% for cough, with 51% reporting fever.⁸ This difference at baseline may be because in present study only smear positive patients were taken.

In present study at two months only 2 (3.7%) study subjects perceived fever, 3 (5.6%) study subjects perceived cough, 7 (13.2%) study subjects perceived dyspnoea, only 3 (5.6%) study subjects perceived chest pain, 3 (5.6%) study subjects perceived sweating respectively. In study by Bark et al at two months 3.1% study subjects perceived fever, 33% study subjects perceived cough, 13% study subjects perceived dyspnoea, only 2.5% study subjects perceived chest pain, 5.8% study subjects perceived sweating respectively.⁸ The difference in finding from present study may be owing to the fact that Bark et al included all non HIV smear positive and smear negative patients, while present study included only smear positive CAT I pulmonary TB patients.⁸

At six months, none of the study subjects reported fever, cough while 2 (3.7%) study subjects complained of dyspnoea. At six months only 1 (1.8%) study subject complained of chest and sweating each. In present study fever, cough decreased rapidly in first two months with near resolution at 6 months of treatment. Bark et al reported that during therapy, fever, sweats, and dyspnoea decreased most rapidly, with near resolution by the end of therapy.⁸ Chest pain and cough resolved more slowly; 13% of subjects reported cough at six months.⁸

CONCLUSION

The impact of anti-tubercular treatment was positive on weight in CAT I tuberculosis patients with increase in mean weight of patients. However, this impact on weight was non-significant. All the five studied symptoms i.e. fever, cough, chest pain, dyspnoea, sweats improved drastically in first two months with near complete resolution in six months of treatment. This study suggests positive impact of anti-tubercular treatment on weight gain and perceived symptoms.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee of Government Medical College, Nagpur

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