


นิพนธ์ต้นฉบับ / Original article

Journal of Medicine and Health Sciences (Vol. 18 No.2 August 2011)

The role of socio-economic factors responsible for non-compliance of directly observed treatment short-course among tuberculosis patients

Md. Salahuddin Ansari¹, Khalid Umar Khayyam², Manju Sharma³, Faisal Imam³, Digamber Behera²

¹College of Applied Medical Science, Shaqra University, Al-Dawadmi, KSA.

²Department of Epidemiology & Public Health, LRS Institute of TB and Respiratory Disease, Sri Aurobindo Marg, New Delhi, India.

³Department of Pharmacology, Faculty of Pharmacy, Jamia Hamdard, New Delhi, India.

Abstract

Introduction: Tuberculosis has gone out of control in many parts of world. The therapeutic regimens given under direct observation as recommended by world Health Organization have been shown to be highly effective for both preventing and treating tuberculosis but poor compliance to anti-tuberculosis medication (ATT) is a major barrier to its global controls.

Objectives: The role of socio-economic factors responsible for non-compliance of directly observed treatment short-course (DOTS) among Tuberculosis Patients.

Materials and Methods: Cross sectional study, interviewed using a set of questionnaire. Participants were enrolled at DOTS centre of Lala Ram Sarup Institute of tuberculosis and Respiratory disease New Delhi, India. Patients who interrupted treatment for more than 2 months consecutively were classified as non-compliance cases. T-test was used for comparing the means of the control and case groups.

Results: Majority of study population (45%) was in age group of 31-45 years, which is the productive age. 85 % noncompliant patients believed anti TB drugs to be bad and 15 % accepted as good for them. Similarly 87 % believed to stop ATT very prematurely as soon as symptoms disappear while 13 % believed to continue as per DOTS volunteer advice. The study revealed that the non-compliance of DOTS was significantly high among those who were less educated, unskilled worker, low family income and upper lower class family.

Conclusion: In Delhi region, the treatment of Tuberculosis was good and did not have much involvement of socio-economical role in the non-compliance of treatment. But still major hurdle is the inadequate education, occupation, and income.

Keywords: Tuberculosis, non-Compliance, adherence, DOTS, treatment outcome.

Md. Salahuddin Ansari 

College of Applied Medical Science, Shaqra University, Al-Dawadmi, KSA.

Tel/Fax: +966-16430206 Mobile Number: +966591624166.

Introduction

Tuberculosis (TB) is one of the major health problems and has gone out of control in many parts of world. In 1993 the World Health Organization (WHO) declared TB a global emergency^{1, 2}. TB is an ancient disease which continues to effect major health challenge to developing countries. Every year almost nine million people develop TB and almost two million die; 35% of cases are from South East Asia region^{3, 4}.

The therapeutic regimens given under direct observation as recommended by WHO have been shown to be highly effective for both preventing and treating TB but poor adherence to anti-tuberculosis medication (ATT) is a major barrier to its global controls⁵. The factors such as self belief after feeling cured, jobs constrains, prolonged period of therapy, socio-economic factors, literacy and social behavior, waiting time with no health education, as well as the adverse drug reaction of anti tubercular drug are the responsible in non-compliance of TB treatment^{6,7}. In treatment of TB, non-adherence to prescribed treatment could lead to treatment failure and development of drug resistance while the patient continues to transmit infection. Non-adherence to treatment poses many additional problems for the tuberculosis control such as, defaulter actions, retrieval efforts and change of

chemotherapeutic schedules, etc., which have an adverse economic impact due to increase in operational costs⁸⁻¹⁰.

Inability to complete the prescribed regimen which is quite common in self-administered treatment is an important cause for treatment failure, relapses, acquired drug resistance and on-going transmission of infection. The consequences of default could be disastrous particularly in the context of intermittent Short Course Chemotherapy (SCC) regimens. Over the years there has been increasing emphasis on Directly Observed Treatment short course (DOTS) to ensure treatment adherence, where in each dose of treatment is given under the observation of a health worker. The adoption of DOTS has given impressive results with higher treatment success being reported from developing countries. The Revised National Tuberculosis Control (RNTCP) based on DOTS strategy was implemented in the India in 1993 and is under rapid expansion since 1998¹¹⁻¹³. the major thrust of RNTCP is achieving a cure rate of more than 85%. Strict adherence to DOTS is likely to minimize defaults and is therefore essential for the desired treatment success^{14, 15}.

Poverty and tuberculosis are intimately connected. The poorer have higher contact rates due to crowded homes, more active infection due to sub-optimal nutrition and working

conditions, and they frequently have less access to diagnostic and treatment facilities¹⁶. They may have less flexibility regarding work and clinic attendance and less ability to pay for medications and transport. A study conducted in an urban area of India in 2000-01 found one quarter of their non-compliant patients were the only economically active person in the family and had no spare time to visit DOTS centers¹⁷. The political commitment of local administrators to control TB in conjunction with policy benefits and incentives to intensify motivation and counseling is essential for sustainability of the DOTS strategy to improve patient's compliance and reduce default^{18, 19}.

This paper reports reasons for non-compliance to treatment among TB patients, elicited during home visits. In the present analysis, patient characteristics related to treatment compliance behavior such as time of default, its frequency, duration were correlated with treatment completion and find out the role of socio-economic status with a view to identifying possible 'risk groups' for focusing preventive actions⁷.

Materials and methods

The cross sectional descriptive study was conducted at various Directly Observed Treatment Short Course centres of Lala Ram Sarup Revised National Tuberculosis Control

Program (LRS-RNTCP) defined area of Lala Ram Sarup Institute of Tuberculosis and Respiratory Disease, Sri Aurobindo Marg, South Delhi, India from 11th February 2009 to 20th July 2009. Total patients enrolled in LRS-RNTCP defined area for treatment were 566 out of which 80 were selected in this study. Forty patients served as control (i.e. group I) & 40 patients as cases (i.e. group II). The group I received short course chemotherapy as per RNTCP guidelines and was categorized as compliance under DOTS. The group II received short course chemotherapy as per RNTCP guidelines but due to some reason/factors interrupt the short course chemotherapy and patient fall under non-compliance. Following were the selection criteria for non-compliance cases:

- (1) ≥ 2 consecutive weeks of therapy were missed
- (2) Treatment was prolonged >30 days longer than planned owing to missed doses or
- (3) Incarceration by the tuberculosis control program for presenting an immediate threat to public health. Patients who missed more than 2 consecutive months of DOT were defined as having defaulted from therapy.

Ten variables were selected for study; the patient's personal factors including age, sex, marital status, socioeconomic class, education levels were studied. Income and occupation

were also observed. The t-test was used for comparing the means of cases and controls. The numbers of proportions were compared with chi-square. The p-value 0.05 was considered as statistically significant. Statistical analysis was performed with SPSS and graphical analysis was performed with Microsoft Excel.

Results

Five hundred and sixty six tuberculosis patients were enrolled for the treatment during period of 11th February 2009 to 20th July 2009 in different DOTS centre of LRS-RNTCP defined area. The study revealed that 69 % were male and 31 % female among them. There were 70 % married and 30 % unmarried among them. The distribution of non-compliance according to age group were found in this manner the highest case of non-compliance were observed in patients aged 31-45 year-old (45%) and the lowest was found in patients aged below 14 year-old (2.5%). Prevalence of non-compliance in patients aged 15-30 years, 46-59 years and over 59 years were 35%, 12.5% and 5%, respectively.

The belief regarding anti tuberculosis therapy was noted and found that 85 % of noncompliant patients believed anti TB drugs to be bad and 15 % accepted as good for them. Similarly 87 % believed to stop ATT very prematurely as soon as symptoms disappear

while 13 % believed to continue as per DOTS volunteer advice.

Their behavior for reducing number of tablets per dose daily was noted and found that 95 % of non-complaint patient agree to do so and only 5 % have taken full dose for whole period. The attitude for 6-8 months long term treatment was noted and observed that 90 % of non-compliant patients self terminated ATT many times to take pause but 10 % believed to continue without discontinuation.

According to education level, 50 %, 37.5%, 5% and 2.5% of non-complaint had finished primary school, high school, intermediate/post high school, and graduated the higher levels. Five percents were illiterate (Figure 1).

The distributions of non-compliant patients according to occupation were noted and it was observed that 42.5 % were unskilled worker; 32.5 % were semiskilled worker; 20 % were skilled worker; 2.5 % were clerk shop owners and farm holders. Moreover, 2.5 % were unemployed TB patients as shown in Figure 2.

The status family incomes of noncompliant TB patients were noted. It was found that 45 % had family income between 2,041 and 6,100; 6 % had family income between < 2,040; 35 % had family income between 6,101 and 10,160; 2 % had family income between 10,161 and 15,280.

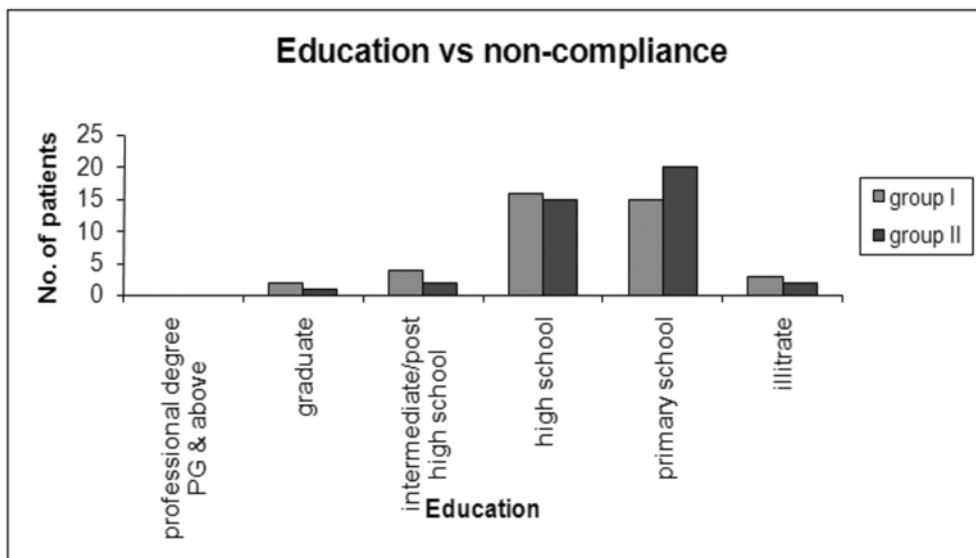


Fig.1 Bar graph Education vs. non-compliance

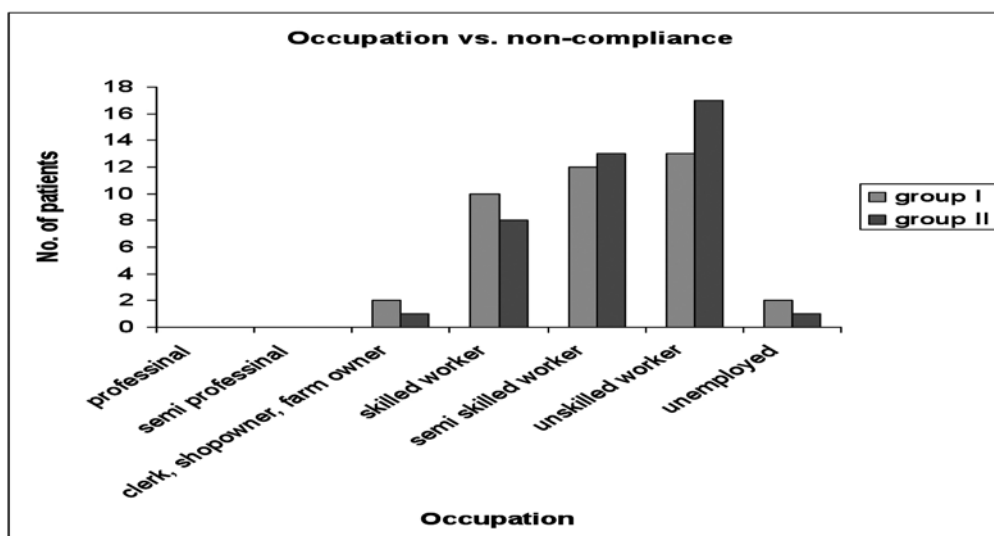


Fig.2 Bar graph Occupation vs. non-compliance

No any patient had family income more than 15,280 (Figure 3).

The socio-economic classes were studied. It was noted that 72.5 %, 22.5%, and 10% of non-compliances were classified as the upper lower class, the lower middle class, and

the lower class, respectively. No any patient was in the upper middle or the upper class of family as shown in Figure 4.

Discussion

The present study revealed that the socio-demographic factors (age, sex, education,

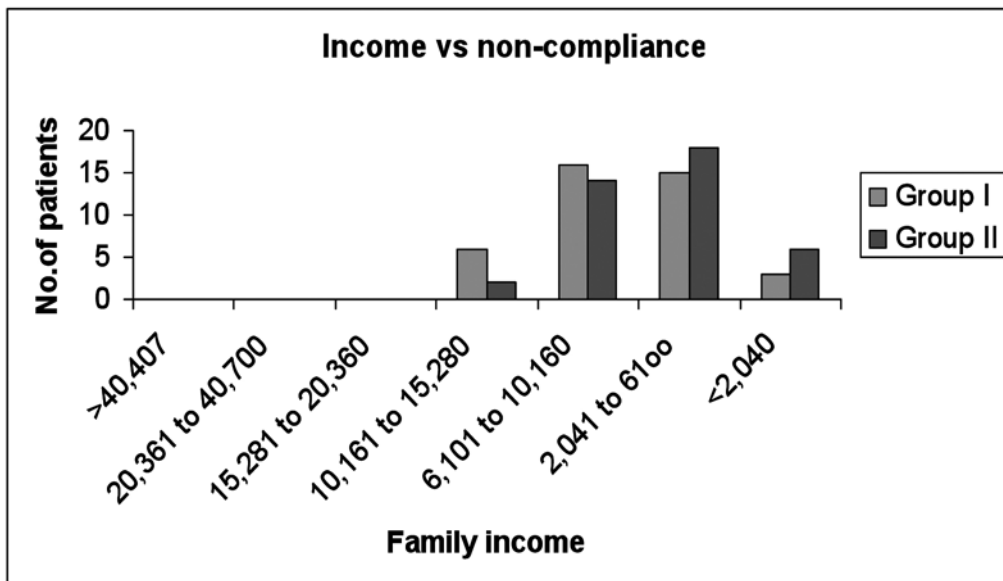


Fig.3 Bar graph Family income vs. non-compliance

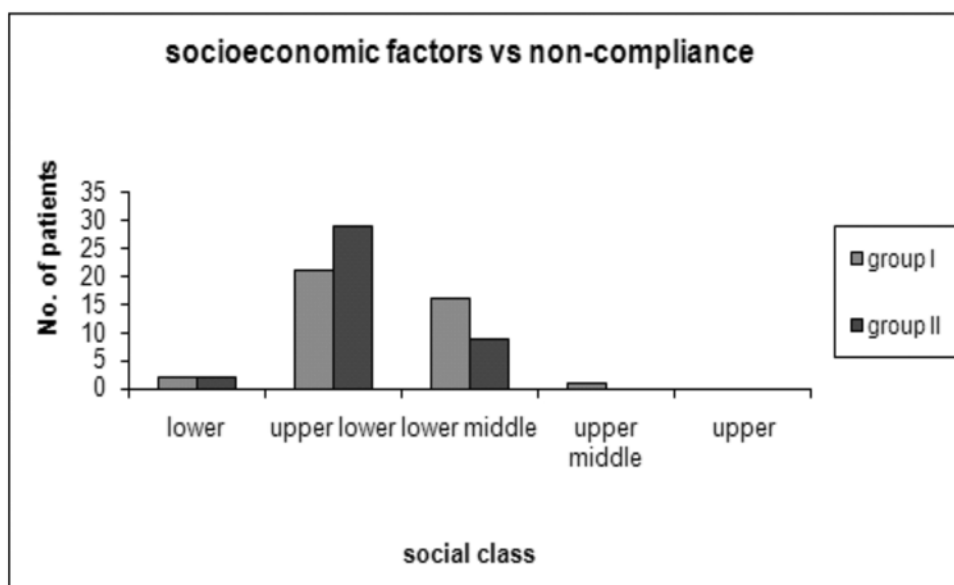


Fig.4 Bar graph Socio-economic class vs. non-compliance

occupation and socio-economic status) were had association with adherence of treatment. It was found that male gender have more noncompliance tendency as compared to female as found by Janani P and Wijitha S also²⁰.

The age of noncompliant patients was studied and found that majority of treatment defaulter were from 31-45 years which is also described by Tissera W⁵. The education and literacy plays vital role for default behaviors of

patients. It was noted that non-compliance in treatment of TB patients of south Delhi among primary pass patients are maximum as reported by Pandit N and Choudhary S also²¹.

The noncompliant patients were using government health centre. It was noted that these patients believed in medicine to be bad for health which is the same described by Malik AS and Ahmad G⁷ that report the behavioral factor in compliance of TB treatment. The study shows that the majority of patients stop their treatment in intensive phase as the symptoms disappear and feel good the same thing was also reported by Vijay S and Balasangameswara VH¹⁴.

We have found that the economic condition have great impact on treatment compliance of TB patients which has been pointed out by Fatiregun AA and Ojo AS²² as factor for nonadherence. The majority of the noncompliant patients answered that long term treatment was difficult to maintain to go the DOTS centre for eating medicine and as well as to maintenance of jobs which was also described by Driver CR and Matus SP²³ also that dropout is due to prolonged treatment.

The occupation of TB patients have direct impact to the compliance of treatment and it was found that the unskilled TB patients were more prone to nonadherence as similarly

also found by Joanna BR and Causland MR²⁴ The socioeconomic status was the one of the major contributing factors for noncompliance of TB treatment which was also pointed out by Dodor EA and Afenyadu GY²⁵.

Conclusion

In Capital of India, especially in south Delhi region the treatment of tuberculosis under DOTS-RNTCP program was good and did not have much involvement of socio-economical role in the non-compliance of treatment. However, inadequate education, occupation, and income were a major hurdle to achieve. The slum and rural area, where Information Education and Communication (IEC) activity was less, contributed for non-compliance of treatment of DOTS as compared to urban area.

Acknowledgments

We thank the medical and DOTS provider and social workers of the DOTS Centre for their enthusiastic cooperation and are grateful to Dr. Rohit Sarin for his continued encouragement. We also thank Mr. Sanjay Saroj for his valuable contribution and Sanjay Mishra, Kusum, Babita for their secretarial help. We are very grateful to the project coordinator and staff of all the centers of LRS Institute for their full cooperation and support. The study would not have been successfully completed without the cooperation of our study patients and their families.

Reference

1. The Department of Health, Prison health, London. Status Paper on Prisons and Tuberculosis. World Health Organization Europe 2007;6-7.
2. Kandel TR, Mfenyana K, Chandia J, et al. The prevalence of and reasons for interruption of anti-tuberculosis treatment by patients at Mbekweni Health Centre in the King Sabata Dalindyebo District in the Eastern Cape Province. SA Fam Pract 2008;50:47.
3. Baltussen R, Floyd K, Dye C. Achieving the millennium development goals for health Cost effectiveness analysis of strategies for Tuberculosis control in developing countries. BMJ 2005;68:1-2.
4. Stop TB Partnership. Global Tuberculosis Control Report. World Health Organization 2010;1-2.
5. Tissera W. Non-compliance with anti-tuberculosis treatment at colombo chest clinic. NTI Bull 2003;39:5-9.
6. Jaggarajamma k, Sudha G, Chandrasekaran V, et al. Reasons for non-compliance among patients treated under Revised national tuberculosis control. Indian J Tuberc 2007;54:130-5.
7. Malik AS, Ahmad G: Tuberculosis: Determinants of treatment non-compliance among patients. Professional Med J 2009;16:70-5.
8. Suhadev M, Ganpathy S, Sivasubramaniarr S, Devi TS. A Retrospective Study of “Non-Compliant” Patients in Controlled Clinical Trials of Short course chemotherapy. Indian J Tuberc 1995;42:220-1.
9. Stop TB Department, WHO Department of Ethics. Guidance on ethics of tuberculosis prevention, care and control. World Health Organization 2010;16:16-7.
10. Nathanson E, Uplekar M, Floyd K, et al. MDR Tuberculosis-Critical Steps for Prevention and Control. N Engl J Med 2010;8:363-5.
11. Burman WJ, Dalton CB, Cohn DL, et al. A Cost-effectiveness Analysis of Directly Observed Therapy vs. Self-administered Therapy for Treatment of Tuberculosis. J Am Coll Chest Physic 1997;112:63-4.
12. Sahu S, Chauhan LS. The Role of WHO in the Successful Implementation and Expansion of the DOTS in India. Tuberculosis Control in India 2006;20:187-9.
13. Muniyandi M, Ramachandran R, Balasubramanian R, et al. Socio-economic dimensions of Tuberculosis control. Review of studies over two decades from tuberculosis research centre. J Commun Dis 2006;38:208-13.
14. Vijay S, Balasangameswara VH, Jagannatha PS, et al. Defaults among tuberculosis

- patients treated under DOTS in Bangalore city: A search for solution. *Indian J Tuberc* 2003;50:184-5.
15. Ministry of Health and Family Welfare-TB India, Government of India. RNTCP Annual Status Report 2011;73-5.
 16. Sango I. Achieving the Millennium Development Goals in an Environmentally Sustainable Way—Some Perspectives Relevant For Zimbabwean Planners. *J Sust Dev Afr* 2007; 9:150-3.
 17. Lamsal DK, Lewis OD, Smith S, et al. Factors related to defaulters and treatment failure of tuberculosis patients in the DOTS Program in the Sunsari district of eastern Nepal. *SAARC J Tuberc, Lung Dis & HIV/AIDS* 2009;6:25-30.
 19. Pichu BL. Effects of Drug administration strategy and health education on knowledge of Pulmonary tuberculosis patients admitted to a tuberculosis hospital. *Indian J Commun Med.* 2004;39:27-9.
 20. Janani P, Wijitha S and Rajitha W. Prevalence and Predictors of Default with Tuberculosis Treatment in Sri Lanka. *Southeast Asian J Trop Med Public Health* 2008;39:1076-82.
 21. Pandit N, Choudhary SK. A study of treatment compliance in directly observed therapy for tuberculosis. *Indian J Commun Med* 2006;31:241-2.
 22. Fatiregun AA, Ojo AS and Bamgboye AE. Treatment outcomes among pulmonary tuberculosis patients at treatment centers in Ibadan, Nigeria. *Ann Afr Med* 2009;8:100-4.
 23. Driver CR, Matus SP, Bayuga S, Winters AI, et al. Factors Associated with tuberculosis treatment interruption in New York City. *J Public Health Manag Pract* 2005;11:361-8.
 24. Joanna BR, Rachel MC, and Elwood JM. Default in the outpatient treatment of tuberculosis in two hospitals in Northern India. *J Epidemiol Commun Health* 1990; 44:20-3.
 25. Dodor EA, Afenyadu GY. Factors associated with tuberculosis treatment default and completion at the Effia-Nkwanta regional Hospital in Ghana. *Trans R Soc Trop Med Hyg* 2005;99:827-32.