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Original Article

Community Medicine Section

Patient and Healthcare System Delays in the Start of Pulmonary Tuberculosis Treatment Among Tribal Patients Registered Under DOTS, Odisha

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ABSTRACT

Introduction: Tuberculosis (TB) is a highly infectious disease which continues to be an important public health problem worldwide.

Aim: This study puts an effort to determine patient and health system delay in diagnosis and treatment and association to specific types of delay among tribals in Mayurbhanj district, Odisha.

Materials and Methods: A total of 261 TB patients reporting to 4 TB Units of Mayurbhanj were interviewed using pre-tested structured questionnaire. Extra-pulmonary TB patients and death cases were excluded. Data entry and analysis was carried out in Epi-info 3.32 version. Chi-square test was used to test the association between dependant variable (patient and health system delays) with different independent variables (age, sex, reasons for delay etc.).

Results: Median patient, health system and total delay were 24, 3 and 24 days respectively. Risk factors that were significantly associated with patient delay were education (95% CI= 1.01-1.11, p=0.015), cost of treatment/transport (95% CI=0.87-1.01, p=0.020), distance (95% CI=1.00-1.29, p=0.002) and lack of awareness about TB (95% CI=1.01-1.34, p=0.001). Health system delay risk factors were distance (95% CI=0.32-0.96, p=0.043), delay due to administrative verification (95% CI=1.18-57.97, p= 0.005) and delay due to traditional healers/ private practitioners (95% CI=1.61-15.45, p=0.0008).

Conclusion: This study revealed longer patient delay compared to health system delay. Therefore, public awareness in tribal dialect about chest symptoms and availability of free diagnostics services should be increased along with involvement of traditional healers.

Keywords: Distance, Health seeking behaviour, Traditional healers

INTRODUCTION

Tuberculosis (TB) is a highly infectious disease which continues to be an important public health problem worldwide [1].

With 1.8 million cases occurring annually, India accounts for a fifth of world's new TB cases. This makes India the highest TB burden country in the world. Two of every five Indians are infected with TB bacillus. Of them 10% will develop TB disease during their lifetime [2].

Delays in diagnosis of pulmonary TB have been noted in both high and low prevalence countries [3]. Delayed diagnosis causes patients to have more advanced disease, increases the patient expenditure and a higher risk of mortality [4].

Magnitude and risk factors for patient and health system delays have been well documented in number of countries where as little is known about these topics in India [4,5] which accounts for nearly 20% of global TB burden [6].

The study was planned in Mayurbhanj district of Odisha, India which constitutes 57.67% tribals of total population. There was neither any nor at present studies reported specially for tribals from Odisha region on patient and health system delay. Therefore, this study intends to bring in a better understanding about delays in tribal pockets. Thus, this study puts an effort to determine patient and health system delay in the diagnosis and treatment and identify causes responsible for delays among tribals which still remains neglected public health area.

The objectives of study were: To determine patient delay and system delay in diagnosis and treatment, identify risk factors responsible for patient delay and system delay and describe TB related health-seeking behaviors of tribal patients reporting to TB and Designated Microscopic Centers (DMC) with three or more weeks of cough and found positive for TB.

MATERIALS AND METHODS

The present Analytical cross-sectional study was carried out in Mayurbhanj district, Odisha, India. The study period was from February to July, 2007. The study population included all New Smear Positive (NSP) pulmonary TB tribal patients, registered under DOTS in 4th quarter from 2006 of four TB units. Patients not registered under DOTS, extra–Pulmonary TB cases and death cases from four TB units were excluded.

The operational definitions used for study were:

Patient Delay: Time interval between onset of cough or other symptoms until the first visit to a health facility. Patients Delay > 21 days, on the basis, that a person with cough for 3 weeks should be a suspect of TB [5-7].

Health System Delay: Time interval from patients 1st visit to health system to the date of start of TB treatment. Health system delay > 7 days assuming that treatment should be started within 7 days of diagnosis of TB [5,6,8].

Total Delay: Sum total of patient delays and system delays.

All NSP pulmonary TB tribal patients from four TB units registered under DOTS in 4th quarter of 2006 were selected as study sample. Pre-tested semi-structured questionnaire was used to conduct the interview [9,10]. Before the interview a written consent was taken from each TB patient. Ethical clearance was taken from Ethics Committee, NCDC, Delhi.

Data after collection was entered and analysis was done using Epi-info 3.3.2 version. Statistical comparisons between groups

were done by using Unadjusted Odds Ratio (UOR), Chi-square test and 95% confidence intervals with statistical significance at p<0.05 to determine significant difference between groups.

RESULTS

A total of 261 out of 267 TB patients could be interviewed from four TB units. Six patients could not be interviewed as they succumbed to the illness. The median patient delay was 24.0 days (range1-709 days) with a mean of 36.5 days. The median health system delay was 3 days (range 1-75 days) with a mean of 11.59 days. The median total delay to confirm diagnosis was 24 days (range 1-710 days) with a mean of 37.52 days. Two hundred and fifty three (97%) TB patients had patient delay and 51 (19.5%) TB patients suffered health system delay.

The higher patient delay was observed among male TB patients 184(96.8%) compared to females.

Majority of TB patients were in the age group of 20-60 years (85.9%). Female TB patients 42 (59.2%) were highest in the age group of 20-40 years. Male TB patients 90 (47.4%) were in the age group of 40-60 years. Maximum number of tribal TB patients were illiterate 145 (55.6%), married 179 (68.6%), farmer by occupation 100 (38.3%), money spent on transport/treatment greater than four hundred rupees 224(86%), poor knowledge about TB 228 (87.4%) distance travelled to reach the DMC/ TB unit was greater than 5 kilometres 223 (85.5%), traditional healers was first choice of health care providers consulted 110 (42%) and self- medication 139 (53.3%).

The main reasons for patient delay among TB patients were lack of awareness about TB (30.5%), long distance of TU/DMC from home (29.9%) which were significantly associated [Table/Fig-1]. Other reasons were poor- socio economic condition (24.1%), loss of wages (10.7%), drinking habits (3.4%) and dependent being too old/young/severely ill (1.4%).

The reasons for health system delay were mainly (48.60%) due to administrative verification regarding presence of DOTS provider in locality for patient medicine distribution timely, (43.17%) delay due to visit to traditional healers/private practitioners after TB diagnosis which were significantly associated [Table/Fig-2]. Other reasons were health personnel absence (6.07%) and medicines out of stock (2.17%).

Determinants	1-21 days	>21days	Unadjusted Odds Ratio	95% CI	p-value
Sex Female Male	 2(2.8%) 6(3.15%)	 69(97.2%) 184(96.85%)	1.003	0.95-1.05	0.623
Age <45 years >45 years	 7(4.3%) 1(1.0%)	 157(95.7%) 96(99.0%)	0.967	0.93-1.00	0.135
Caste Others Tribes	 3(10.7%) 5(2.1%)	 25(89.3%) 228(97.9%)	1.1	0.96-1.25	0.043*
Marital Status Married Single	 6(2.9%) 2(3.8%)	 202(97.1%) 51(96.2%)	1.01	0.95-1.07	0.508
Education Illiterate Literate	 1(0.7%) 7(6.0%)	 144(99.3%) 109(94%)	1.06	1.01-1.11	0.015*
Family Size <6 >6	 4(4.9%) 4(2.2%)	 77(95.1%) 176(97.8%)	1.03	0.97-1.04	0.210
Occupation Employed Unemployed	 4(2.3%) 4(4.9%)	 176(97.8%) 77(95.1%)	0.97	0.92-1.03	0.210
Monthly Income <Rs 1000 >Rs 1000	 4(2.3%) 4(4.9%)	 167(97.7%) 86(95.6%)	1.02	0.97-1.07	0.280
Treatment / transport <Rs 100 >Rs 100	 3(1.5%) 5(8.1%)	 196(98.5%) 57(91.9%)	0.93	0.87-1.01	0.020*
Medication Yes No	 3(2.2%) 5(4.1%)	 136(97.8%) 117(95.9%)	1.02	0.98-1.07	0.291
Distance <5 km >5 km	 5(13.2%) 5(1.3%)	 33(86.8%) 220(98.7%)	1.14	1.00-1.29	0.002*
Poor socio-economic cond Yes No	 4(4.9%) 4(2.2%)	 176(97.8%) 77(95.1%)	1.03	0.97-1.09	0.210
Alcohol: Yes No	 0(0) 8(3.4%)	 25(100%) 228(96.6%)	1.04	1.01-1.06	0.441
Loss of wages Yes No	 2(2.5%) 6(3.3%)	 78(97.5%) 175(96.7%)	1.01	0.96-1.05	0.534
Old/young/ ill Yes No	 0(0) 8(3.2%)	 10(100%) 243(96.8%)	1.03	1.01-1.06	0.728
Lack of awareness of TB. Yes No	 3(1.3%) 5(15.15%)	 225(98.7%) 28(84.85%)	1.16	1.01-1.34	0.001*

[Table/Fig-1]: Bivariate analysis of Patients Delay determinants

Determinants	1-7 days	>7 days	Unadjusted Odds Ratio	95% CI	p-value
Sex Male Female	 151(79.5%) 59(83%)	 39(20.5%) 12(17%)	0.82	0.46-1.48	0.512
Age <45 years >45 years	 130(79.3%) 80(82.5%)	 34(20.7%) 17(17.5%)	0.85	0.50-1.43	0.528
Caste Others Tribes	 20(71.4%) 190(81.5%)	 8(28.6%) 43(18.5%)	0.65	0.34-1.23	0.203
Marital Status Married Single	 164(78.8%) 46(86.8%)	 44(21%) 7(13.2%)	1.60	0.76-3.35	0.193
Education Illiterate Literate	 122(84%) 88(75.9%)	 23(15.9%) 28(24.1%)	1.82	1.12-2.96	0.094
Family Size <6 >6	 58(71.6%) 152(84.4%)	 23(28.4%) 28(15.6%)	0.66	0.40-1.08	0.015*
Occupation Employed Unemployed	 152(84.4%) 58(71.6%)	 28(15.6%) 23(28.4%)	0.66	0.40-1.08	0.015*
Monthly Income <Rs 1000 >Rs 1000	 144(84.2%) 66(73.3%)	 27(15.8%) 24(26.7%)	1.69	1.04-2.75	0.035*
Treatment / transport cost <Rs 100 >Rs 100	 165(82.9%) 45(72.6%)	 34(17.1%) 17(27.4%)	1.60	0.97-2.67	0 .073
Self-Medication Yes No	 118(84.9%) 92(75.4%)	 21(15.1%) 30(24.6%)	0.61	0.37-1.01	0.054
Distance <5 km >5 km	 26(68.4%) 184(82.5%)	 12(31.6%) 39(17.5%)	0.55	0.32-0.96	0.043*
Medicine Stock Yes No	 9(90%) 201(80.1%)	 1(10%) 50(19.9%)	0.50	0.08-3.28	0.385 (Fisher-exact)
Health Worker (Present) (Absent)	 23(82.1%) 187(80.3%)	 5(17.9%) 46(19.7%)	0.90	0.39-2.09	0.812
Administrative verification. Yes No	 174(77.7%) 36(97.3%)	 50(22.32%) 1(2.7%)	8.26	1.18-57.97	0.005* (Fisher-exact)
Traditional healer / Pvt. Practioner Yes No	 151(75.9%) 59(95.2%)	 48(24.1%) 3(4.8%)	4.98	1.61-15.45	0.0008* (Fisher-exact)

[Table/Fig-2]: Bivariate Analysis of System Delay Determinants

DISCUSSION

The present study highlights the problem of patient and health system delays and the reasons associated with delays among tribal TB patients. The median and mean patient delays were 24 days and 36.5 days respectively and system delay was 3 days and 11.59 days. Total median and mean delays were 24 and 37.52 days. Similar findings were reported in Sikkim and South India [4,10] and there are studies who have also reported higher delays in high burden countries [11-22]. Though median and mean delays in present study were less compared to other high burden countries, it must not be overlooked, as it is a tribal pocket.

In this study (73%) males patients showed higher patient delay as compared to females (27.2%), which may be because of men using various forms of substance abuse and frequent contact with infected persons where as females in rural areas especially in tribal, women with TB may not be seeking care within TB programme or not receiving treatment or they must be visiting traditional healers /private practitioners. Studies in India and Vietnam indicate that women are ostracized in the household and neighborhood [2,9,17].

Age distribution pattern in the present study was similar to other studies conducted in India [2,9,23,24,31] which have reported peak levels of delaying was in the age group of 20-40 years and 40-60 years. Most of tribal TB patients were illiterate (55.6%), farmers (38.3%) and daily wagers (30.7%) by occupation. Studies conducted in India have reported similar findings [23-25]. It is obvious that since most of tribal TB patients are in their productive years of life which is definite to affect the economic condition of family in case of males who do not intend to lose daily wages where as in females it severely affects their social and personal life and as well as hampers their reproductive cycle.

Our study reveals that majority of tribal TB patients (87.4%) have poor knowledge about TB, (98.7%), lived at a distance of more than 5km from the health facility and (42.1%) first consulted traditional healers or private doctors (34.1%). Over half of patients (53.3%) were on self medication such as home remedies and cough syrups during the initial stage of health problems. Some patients in tribal areas had to travel nearly 40 km to reach health center with microscopic facilities, for which patient delay is obvious. In our study majority of patients were on self-medication which caused patient and health system delays but were statistically insignificant. Studies carried out in Vietnam, USA and India have shown that self-medication is a predictor of delays in diagnosis and treatment of TB [1,4,9,10,12,19-22,24-27].

Patient delay was high in our study, which may due to various problems faced by tribal patients. The most common self reported reasons for patient delay were lack of awareness about TB which was significantly associated and was nearly equal in either sex which may be ascribed to illiteracy or due to limitations of non tribal health workers in motivating the tribal patients in their preferred local language. Tribal community leaders appointed as DOTS providers can be an effective connecting link between the programme and the tribal community which needs to be looked upon.

In our study patient delay was significantly associated with other factors such as illiteracy, caste, cost of treatment/ transport and distance. Mode of transport/treatment too influenced patient delay, which is directly linked with money spent as patients had to come from distant places. Although “direct costs” of diagnosis and treatment were significant for poor families, the greatest economic loss occurs as a result of “indirect” costs, such as loss of employment, travel to health facilities, sale of assets to pay for treatment-related costs, and in particular, lost productivity from illness and premature death. Similar findings were reported from studies in Malaysia, Lusaka, Vietnam, rural China and India [4,10,12,16,24,27-29]. Factors like old age, loss of wages, poor socio-economic condition and drinking habits also contributed to patient delay but were statistically insignificant.

The most common reasons for health system delay was (48.60%) due to administrative verification regarding DOTS provider presence in the area and delay due to visit to traditional healers/ private practioners (43.1%) after diagnosis. Both the factors were significantly associated. Studies conducted in the other countries have also highlighted the weak links at the point of first contact such as traditional healers in Tanzania, Nepal, Ethiopia, Peru and private practioners in Ghana and Sikkim [10,13,18,30,31]. The concept of private public mix though has been successfully exemplified in non- tribal areas but seem to be non existence in this tribal region as there is minimal presence of private sector. So efforts should be taken to encourage NGOs and set up more health facility in the area. Besides the above other socio demographic factors that were found significantly associated with health system delay were family size, occupation, distance and monthly income [24].

The present study had some limitations regarding the duration of patient delay which may have been little underestimated as new definition for “TB suspect with 2 weeks duration of cough” (2009) had not been taken into account and another was of poor patient recall of onset of symptoms, their duration and date of the first health-seeking encounter.

CONCLUSION

The period before diagnosis and start of treatment is important since most of disease transmission occur during this time. However, a big chunk of tribal TB patients had delayed for more than 21 days. Although most patient characteristics were statistically insignificant with patient and health system delays. Illiteracy, lack of awareness about TB, long distance, cost of treatment/ transports were strongly associated with patient delay. The choice of traditional healers /private practitioners, occupation, and administrative verification were strongly associated with health system delay. To reduce patient delay it is crucial to improve TB knowledge, address TB misconceptions in tribal dialect, ensure the involvement of traditional healers and pay closer attention to setting up of treatment/microscopic centers at accessible distance. Health system delay can be reduced by developing public private partnerships and flexible administrative approach in hard core reach areas.

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REFERENCES

[1] Smith I. What is the health, social and economic burden of TB? Pages 233-237. In: Frieden T. Toman’s TB case detection, treatment and monitoring questions and answers. 2nd edition, Geneva, WHO 2004.
[2] TB India 2007, RNTCP Status Report. Central TB Division, Ministry of Health & Family Welfare, New Delhi.
[3] Jagota P. Sociological Research conducted in the field of TB in India. *STC Newsletter*. 1999;2:5-15.
[4] Rajeswari R, Chandrsekharan V, Suhadev M, Sivasubramaniam S, Sudha G, Renu G. Factors associated with patient &health system delays in the diagnosis of Tuberculosis in South India. *Int Jour Tuberc Lung Diseases*. 2002;6(9):789-95.
[5] Chakarborty AK, Krishanamurthy AN, Shashidhara AN, Juvekar S. Missed opportunities for diagnosis of Pulmonary TB: a study among rural patients seeking relief on their own under the TB programme in India. *Indian Journal of Tuberc*. 2001;181-192.
[6] Chauhan LS. TB control in India. Reed Elsevier India Pvt Limited, Delhi. 2005, pages 23-34.
[7] Murray, Christopher J.L, Lopez, Alan D. The global burden of disease; a comprehensive assessment of mortality and disability from disease, injuries and risk factors in 1990 & projected to 2020; Summary – WHO Geneva, Switzerland 1996.

[8] Ngamvithayapong J, Yanai H, Winkvist A, Diwan V. Health seeking behaviour and diagnosis for pulmonary TB in an HIV epidemic mountaineous area of Thailand. *Int Journal of Tuber Lung Diseases*. 2001;5(11):1013-20.
[9] Rajamma JK, Rao DVB, Narayana ASL, Rajeswari R, Prabhakar R. Health seeking behaviour, Acceptibility of available health facilities & knowledge about TB in tribal area. *Indian Journal of Tuberculosis*. 1996;43:195.
[10] Tobgay KJ. Predictors of treatment delays for tuberculosis in Sikkim. *Natl Med J India*. 2006;19(2):60-3.
[11] Banerjee A, Sharma BV, Ray A, Kannuri NK, Venkateswarlu TV. Acceptability of traditional healers as directly observed treatment providers in TB control in a tribal area of Andhra Pradesh, India. *Ind Journal Tuber*. 2004;8(10):1260-65.
[12] Bai LQ, Xiao SY. Factors associated with diagnostic delay for patients with smear-positive pulmonary tuberculosis in rural Hunan, China. *Chinese journal of Tuberculosis & Lung Diseases*. 2004;27(9):617-20.
[13] Cambanis A, Yassin AM Ramsay A, Bertel Squire S, Arbide I, Cuevas LE. Rural poverty and delayed presentation to TB services in Ethiopia. *Tropical Medicine and International Health*. 2005;10(4):330-35.
[14] Demissie M, Lindtjorn B, Berhane Y. Patient &Health System delay in the diagnosis of Pulmonary Tuberculosis in Ethiopia. *BMC Public Health*. 2002;2:23.
[15] Farah GM, Rygh HJ, Steen TW, Selmer R, Heldal E, Bjune G. Patient and health care system delays in the start of TB treatment in Norway. *BMC Infectious Diseases*. 2006;6:33.
[16] Kiwuwa M, Charles K, Mayanja KH. Patients and health service delay in pulmonary TB patients attending a referral hospital: a cross-sectional study. *BMC Public Health*. 2005;5:122.
[17] Long NH, Johansson E, Lönnroth K, Eriksson B, Winkvist A, Diwan VK. Longer delays in TB diagnosis among women in Vietnam. *Int Journal of Tuber Lung Diseases*. 1999;3(5):388-93.
[18] Nakagawa YM, Ozasa K, Yamada N, Osuga K, Shimouchi A, Ishikawa N, et al. Gender difference in delays to diagnosis and health care seeking behaviour in a rural area of Nepal. *Int Journal of Tuber Lung Diseases*. 2001;5(1):24-31.
[19] Pronyk PM, Makhubele MB, Hargreaves JR, Tollman SM, Hausler HP. Assessing health-seeking behaviour among tuberculosis patients in rural South Africa. *Int J Tuberc Lung Dis*. 2001;5(7):619-27.
[20] Wandwalo ER, Morkve O. Delay in tuberculosis case finding and treatment in Mwanza, Tanzania. *Int J Tuberc Lung Dis*. 2000;4(2):133-38.
[21] Ward J, Siskind V, Konstantinos. Patients and health care systems delays in Queens land TB patients, 1985-1998. *Int J Tuberc Lung Dis*. 2001;5(11):1021-27.
[22] Yjmer S, Bjune G, Alene G. Diagnostic and treatment delay among pulmonary tuberculosis patients in Ethiopia: a cross sectional study. *BMC Infect Dis*. 2005; 5:11.
[23] Narzary PK, Narzary B. Treatment seeking behaviour of TB among Boro Tribe in India. Stud. *Tribes Tribal's*. 2005;3(2):129-32.
[24] Basa S, Venkatesh S. Study on default and its factor associated among Tuberculosis patients treated under DOTS in Mayurbhanj district, Odisha. *Journal of Health Research & Reviews*. 2015;2(1):25-28.
[25] AC Neilson-ORG. Social assessment survey for RNTCP, 2005. AC Neilson-ORG Centre for Social Research, New Delhi, India.
[26] Asch S, Leake B, Anderson R, Gelberg L. Why do symptomatic patients delay obtaining care for TB? *Am J Respir Crit Care Med*. 1998;157:1244-48.
[27] Faussett GP, Kaunda H, Kamanga J, Beers SV, Cleev M, Phiri R, et al. Why do patients with a cough delay seeking care at Lusaka urban centers? A health systems research approach. *Int. Journal. of Tuber Lung Diseases*. 2002;6(9): 796-80.
[28] Hoa PN, Thorson A, Long NH, Diwan VK. Knowledge of TB and associated health seeking behaviour among rural Vietnamese adults with a cough for at least 3 weeks. Scand. *Journal. Public Health*. 2003;31(SUPPL-62):59-65.
[29] Hooi LN. Case finding for Pulmonary TB in Penang. *Med J Malaysia*. 1994;49: 223-30.
[30] Lawn SD, Afful B, Acheampong JW. Pulmonary Tuberculosis: Diagnostic Delay in Ghanaian adults. *Inter J Tuber Lung Diseases*. 1998;2(8):635-40.
[31] Oser CC, Escombe AR. Does traditional medicine use hamper efforts at TB control in urban Peru? *J Tropical Med Hyg*. 2005;73(3):571-75.

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