RESEARCH ARTICLE

ASSESSMENT OF FACTORS CAUSING TREATMENT DELAY AMONG NEWLY DIAGNOSED SMEAR POSITIVE PULMONARY TB PATIENTS SEEKING CARE FROM RNTCP: CROSS SECTIONAL STUDY

Dr. Jayashree. M. H, *Dr. Mubashir Angolkar, Dr. Oza Mrunal, J., Mutisya M Faith and Dr. B. R. Ashok Kumar

Department of Public Health, J.N. Medical College, KLEU, Belagavi, Kanataka, India

ABSTRACT

Background: Tuberculosis is among the top ten causes of global mortality. Among infectious disease, according to global tuberculosis report by WHO 2014, 9.0 million people develop TB and 1.5 million died from the disease.

Objectives: To determine the factors causing delay in treatment of pulmonary tuberculosis patients.

Material and Method: A cross sectional study was conducted among new smear positive pulmonary tuberculosis patients seeking treatment of DOTS under RNTCP at civil hospital Belagavi district. Purposive sampling was used to get 110 patients. A predesigned and pretested questionnaire was used to collect data on Socio-economic and demographic particulars, health seeking behavior after obtaining informed consent. Data was entered through SPSS version 16 and frequency, percentage and chi square test were calculated.

Results: A total of 110 patients were enrolled in the study where mean age was found 40.81 yrs, majority of males 19(17.3%) were laborers whereas females 20(18.4%) were housewives. Among the participants 36(32.7%) were illiterates, 81(73.6%) were married and 27 (24.5%) were unmarried. 89(80.9%) participants lived in urban area and 73(66.4%) were living with >6 members in a family. Factors like self medication, use of traditional healers and alcohol use caused patients delay more than 30 days. Health System Delay for > 7 days was strongly associated with Self medication and use of traditional healers. Majority of the patients 49(44.5%) said being too busy was their reasons for not visiting health care providers (HCP).

Conclusion: Self medication, use of traditional healers and alcohol use were factors associated with patients and health system delays.

INTRODUCTION

Tuberculosis is among the top ten causes of global mortality, (Murray *et al.,* 9061). According to WHO report 9.0 million people developed TB and 1.5 million died from the disease whereas multi drug resistant TB (MDR-TB) was 3.5% throughout the world. Among 9 million cases 56% of cases were from South East Asia and western Pacific Region, http://www.who.int. TB prevalence in India is 230/ 100,000 population, (http://www.tbcindia.nic.in) It is estimated that on an average untreated smear positive patients can spread infection to 15- 20 people annually under natural course of untreated disease. Delay in diagnosis of tuberculosis, causes spread of infection in the community, increases patient

*Corresponding author: Dr. Mubashir Angolkar,
Department of Public Health, J.N. Medical College, KLEU, Belagavi, Kanataka, India.

expenditure and is associated with a higher risk of mortality, (Bustamante Montes, 2000). TB diagnosis can be delayed when patients postpone seeking care until much after the onset of symptoms (patient delay), or when health providers take more time than required to diagnose patients seeking care (health system delay). The magnitude and risk factors for patient and health system delays have been well documented in a number of countries, (Long, 1999) although little is known about these topics in India, TB accounts for nearly 30% of the global tuberculosis burden, (Khatri, 2000) Although Tuberculosis (TB) is both preventable and curable, it remains a leading infectious cause of morbidity and mortality worldwide. In 2007, the World Health Organization (WHO) estimated 9.27 million new cases of TB with 1.3 million deaths, (World Health Organization, 2009). To decrease the impact of TB, the United Nations included TB prevention and control among its eight Millennium Development Goals, with a proposal to

reduce TB incidence to half the 1990 level by 2015.8 To measure and achieve this, the World Health Assembly (WHA) highlighted two indicators: 70% global and in-country case detection rates and successful treatment of 85% of Cases, (World Health Organization, 2009). Hence the present study has been undertaken to known the diagnosis and treatment delay factors for pulmonary tuberculosis and also the socio-demographic parameter's that affecting the TB patients on diagnosis and treatment delay.

MATERIALS AND METHODS

A cross sectional study was done among newly diagnosed TB patients seeking treatment under RNTCP in civil hospital, Belagavi district who had started taking treatment one week before or within the study period. The study was done for 10 months from 1st February to 30th November 2011 and a total of 110 patients were included in the study. Purposive sampling was used for selection of participants. A pre-tested interview schedule was used to collect information based on socio-economic and demographic particulars, health seeking behavior regarding more than 30 days and reasons for delay. The participants included in the study were all newly diagnosed smear positive pulmonary TB patients seeking treatment during the study period and those who gave informed consent to participate in the study. The participants excluded were patients with positive smear already on RNTCP treatment, patients diagnosed with negative smear for pulmonary TB and those who did not give informed consent.

Health care System delay: Time interval between the date of health-seeking behavior and confirmation of diagnosis and initiation of anti-tuberculosis treatment. (In this study, the time interval more than 7 days was considered as health system delay).

Data Analysis: Data was serially coded and entered in SPSS (windows 16.0) software and analysis was done using percentage and chi-square test to test the association between the variables.

RESULTS

In present study there were 65 males and 45 females, in both males and females most them were in the age group of 25-34yrs (Table no.1). Majority 36(32.7%) were illiterate, 27(27.5%) secondary school educated; 25(22.7%) were primary educated; 13(3.6%) studied up to PUC, 4(3.6%) had completed diploma and graduation only one student was studying post graduation 1 (0.9%). In this study maximum study participants 81(73.6%) were married, 27 (24.5%) single; 2 (1.8%) were divorced/separated and none was found widow. Participants who were from urban area were 89(80.9%); followed by suburban 18(16.4%); and from rural 3(2.7%). About 73(66.4%) were living with the family of more than 6 members and about 37(33.6%) were living with less than 5 members in their families. Majority of participants were from SES class III i.e. 67(60.9 %); followed by class V i.e. 27(24.5%); then with class IV i.e. 16(14.5%).

Table 1. Distribution of participants according to socio- demographic data

	Variables	Male N (%)	Female N (%)	Total
Age group*	≤24	9(13.8)	13(28.9)	22(20)
	25-34	14(25.5)	16(35.6)	30(27.3)
	35-44	12(18.5)	2(4.4)	14(12.7)
	45-54	14(21.5)	5(11.1)	19(13.3)
	55-64	8(12.3)	3(6.7)	11(10)
	>65	8(12.3)	6(13.3)	14(12.3)
Literacy status	Illiterate	22(33.8)	14(31.1)	36(32.7)
	Primary	14(21.5)	11(24.4)	25(22.7)
	Secondary	19(29.2)	8(17.8)	27(24.5)
	PUC	4(6.2)	9(20)	13(11.8)
	Diploma	2(3.1)	2(4.4)	4(3.6)
	Graduation	4(6.2)	0	4(3.6)
	PG	0	1(2.20	1(0.9)
		Frequency (%)		
Family members	1-5	37(33.6)		110(100)
	>6	73(66.4)		
Marital status	Married	81(73.6)		110(100)
	Single	27(24.5)		
	Divorced	2(1.8)		
Residence	Urban	89(80.9)		110(100)
	Sub- Urban	18(16.4)		
	Rural	3(2.7)		

* (χ^2 = 3.725; df =1; P=0.054.) for age group

### Definition of study variables

Dependent variables for the study were patients delay, Health system delay.

Patient delay: Time interval between onset of symptom and presentation to a health care provider. (In this study, the time interval up to 4 weeks was consider as non-delay, and more than 4 weeks as delay).

Determinants of Delays factors of study participants

Among 110, patients not visiting HCP was due to reason like Too busy 49(44.5%), too far were 24(21.8%) and 10(9.1%) due to long waiting time and other reason cited were due to negligence, lack of knowledge etc were 27(24.5%). (Graph no.1) Table 2. Reports the factors that caused the delay, self medication, choice of 1st health system contact, use of traditional healers and alcohol user were the factors strongly

associated with patient's side delay of more than 30 days. Higher proportion of those who indulged in self medication experienced a delay of more than 30 days compared to those who did not resort to self medication. The difference was statistically significant (p=0.02). The delay was significantly (p=0.02) higher among those who consulted government health care providers compared to others. Similarly, the delay was more for those who use traditional healers and currently used alcohol
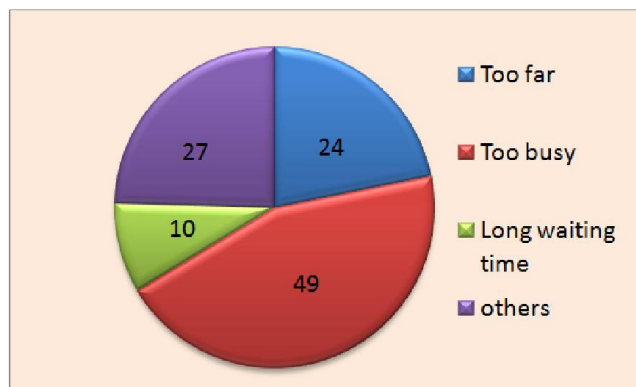
Graph 1. Distribution of study participants according to reason for not visiting HeathCare Provider after onset of symptoms (n=110)

Table 2. Reports factors that caused the delay, self medication, choice of 1st health system contact and use of traditional healers were the factors strongly associated with Health System Delay of more than 7days. A greater proportion of participants, who had been to a private doctor first, experienced health system delays compared to those who went to government health providers (p=0.001) which is statistically significant and those who approached government providers had lesser health system delay compared to those who visited private or other providers (p=0.001), Health system delay was higher for those who did not use self medication.

on diagnosis and treatment delay and to determine the delay factors in diagnosis and treatment of pulmonary tuberculosis. In our study we had 65 males and 45 females as our participants, majority of participants belonged to age group of 25-34 yrs, 36(32.7%) were illiterate, 27(27.5%). Total 89(80.9%) belonged to urban area, followed by suburban 18(16.4%) from sub urban and 3(2.7%) from rural area. Another cross sectional study conducted in 385 TB patients who visited 21 DOTS clinics in Luanda 229 were male and 156 were females. The level of education and employment is significantly higher among males than females (p < 0.01), as is income (p < 0.05), (72%) lived in urban areas and 108 (28%) in suburban areas.9 In present study majority of them were 81(73.6%) were married, A cross sectional study conducted at the chest clinic Jericho Ibadan which showed 19.6% of the respondents not married, while 60.8% were married at the time of interview, (Fatiregun and Ejeckam, 2010). In our study 73(66.4%) were living with the family of more than 6 members and about 37(33.6%) study participants were living with less than 5 members in their families. A cross sectional study conducted in Navi Mumbai showed that participants who had < 5 family members were 76(62.3%) and >5 members were 46 (37.7%), (Konda *et al.*, 2014). In our study we found the factors that caused the patient delay, self medication, use of traditional healers and alcohol user were the factors strongly associated with patient's side delay of more than 30 days. Higher proportion of those who indulged in self medication experienced a delay of more than 30 days. The difference was statistically significant (p=0.02). The delay was significantly (p=0.02) higher among those who consulted government health care providers compared to others. Similarly, the delay was more for those who use traditional healers and currently used alcohol. Another study conducted in Zimbabwe found median of 28 days for patient delays, 184 (48%) experienced patient delays >30 days in seeking TB treatment services, factors associated with patient delay, like taking treatment at rural primary health facilities were significant (p = 0.01).

Table 2. Determinants of treatment delay

Delays	Determinants	Days		Total	P value
		1-30	> 31		
Patients delay	No self medications	28(75.6%)	9(24.3%)	37(100%)	
	Self medication	59(80.8%)	14(19.1%)	73(100%)	0.02
	Government provider	7(63.6%)	4(36.3%)	11(100%)	
	Private provider	80(80.8%)	19(19.1%)	99(100%)	0.022
	No traditional healer	65(80.2%)	16(19.7%)	81(100%)	
	Traditional healer	22(75.8%)	7(24.1%)	29(100%)	0.042
	No alcohol use	56(83.5%)	11(16.41%)	67(100%)	0.03
	Present alcohol user	7(58.3%)	5(41.6%)	12(100%)	
	Past alcohol user	24(77.4%)	7(22.5%)	31(100%)	
		Days			
		1-7	> 8 days		
Health care system delay	No self medications	37(69.8%)	16(30.1%)	53(100%)	<0.001
	Self medication	39(68.4%)	18(31.5%)	57(100%)	
	Government provider	56(70.8%)	23(29.1%)	79(100%)	<0.001
	Private provider	20(64.5%)	11(35.4%)	31(100%)	
	No traditional healer	60(68.1%)	28(31.8%)	88(100%)	0.33
	Traditional healer	16(72.7%)	6(27.2%)	22(100%)	

DISCUSSION

The present cross sectional study was conducted in Tuberculosis unit at Belgaum civil hospital. With an attempt to study the various socio-demographic parameters of TB patients

Patients who started TB treatment at rural facilities accessed traditional healers first rather than accessing other types of health facilities was not statistically significant. Those taking between 30 minutes to an hour to reach their DOT facilities (p = 0.013) and >1 hour (p = 0.032) were both less likely to

experience patient delays when compared to those reaching the DOT facility in less than 30 minutes.12 In the present study reports the factors that caused the delay, self medication, choice of 1st health system contact and use of traditional healers were the factors strongly associated with Health System Delay of more than 7days. A greater proportion of participants, who had been to a private doctor first, experienced health system delays compared to those who went to government health providers (p=0.001) which is statistically significant and those who approached government providers had lesser health system delay compared to those who visited private or other providers (p=0.001), health system delay was higher for those who did not use self medication. Another cross sectional study conducted in Luanda the median health system delay was seven days. Three independent predictors of health service delay >2 weeks, after adjusting for other variables namely: living in a suburban (p = 0.011) waiting time in the centre >1 hour (p = 0.002) and the centre of the first contact differencing from the DOTS center (p < 0, 00001).9

Conclusion

The study concluded that TB affects productive age groups 25-60yrs. TB incidence is more among males than females. Most of the participants belonged to lower socio economic status classes III, (As per modified B. G. Prasad's classification of SES) illiteracy or low level of education is one of the important contributing factors for the delay in the community. Treatment delay was associated with patients and health system delay. Patients delay > 30 days was due to self medication, use of traditional healers and alcohol use, whereas in Health System Delay for > 7 days was strongly associated with Self medication and use of traditional healers.

Recommendations

Improve awareness in the population regarding initial signs and symptoms of tuberculosis and DOTS programme. Decentralization of DOTS diagnostic and treatment centers should focus more on peripheral areas. Provision of free diagnostic facilities for patients visiting private Health care provider's service should be made.

Limitation

Patient recall regarding the onset of symptoms may be inaccurate. The use of non probability (purposive) method of sampling could be the limitation of the study.

Acknowledgements

REFERENCES

Bustamante Montes L P, Escobar, Mesa A, Borja-Aburto V H. Predictors of death from pulmonary tuberculosis: the case of Veracruz, Mexico. *Int J Tuberc Lung Dis.,* 2000; 4: 208–215.

Dr. Mubina Agboatwalla Dr. G. N. Kazi Dr. Karam Ali Shah et.al case-finding in tuberculosis patientsdiagnostic and treatment delays and their determinants in Pakistan. available from http://www.biomedcentral.com/1471-2458/10/263 accessed on 14.04.2015

Fatiregun A.A. and C.C. Ejeckam, Determinants of patient delay in seeking treatment among pulmonary tuberculosis cases in a government specialist hospital in Ibadan,Nigeria *Tanzania Journal of Health Research* Volume 12, Number 2, April 2010. 24-36.

Global tuberculosis report 2014. http://www.who.int accessed on 12/4/15.

Karma Jigme Tobgay, P. Sankara sarma, K. R. Thankappan predictors of treatment delays for tuberculosis in sikkim volume 19, number 2 march / april 2006. Available from http://www.biomedcentral.com/1471-2458/10/263 accessed on 06.05.2011.

Khatri G R, Frieden T R. The status and prospects of TB control in India. Int J Tuberc Lung Dis 2000; 4: 193–200.

Konda, S.G, Melo, C A, Giri, P A, Behera, A B, 2014, Determinants of delay in diagnosis and treatment of pulmomary tuberculosis in a new urban township in India: A cross- sectional study. *Int J Med Sci public Health*, 3:140-145.

Long N H, Johansson E, Lonnroth K, *et al*. Longer delays in tuberculosis diagnosis among women with TB in Vietnam. Int J Tuberc Lung Dis 1999; 3: 388–393.

Lusignani S L, Quaglio G, Atzori A, Nsuka J, Grainger R, Factors associated with patient and health care system delay in diagnosis for tuberculosis in the province of Luanda, Angola. BMC Public Health. 2013; 13:168. http://www.biomedicalcentral.com/1471-2334/13/168 [accesse on 11/4/2015]

Muhammad AN Saqib, Irum N Awan, Syed KA Rizvi Delay in diagnosis of tuberculosis in Rawalpindi, Pakistan ©2011 Khanum *et al*; licensee BioMed Central Ltd. available from http://www.biomedcentral.com/1471-2458/10/263

Murray, C.J and Lopez, A.D. 9061. Mortality by cause for eight regions of the world: global burden of disease study. Lancet, 1997; 349:1269-76.

Revised National TB Control Programme. http://www.tbcindia.nic.in accessed on 12/4/15.

Takarinda C K, Harries A D, Nyathi B, Ngwenya M, Apollo M T, Sand C tuberculosis treatment delays and associated factors within the Zimbabwe national tuberculosis program, Bio Medical care 2015, 15:29.

Tatek Wondimu, Kifle W/Michael *et al*. Delay in initiating tuberculosis treatment and factors associated among pulmonary tuberculosis patients in East Wollega, Western Ethiopia *Ethiop.J.Health* Dev. Available from http://www.biomedcentral.com/1471-2458/10/263 2007; 21 accessed on 20.04.2015

UN Web Services Section, UN Millennium Development Goals, United Nations, 2008, available from http://www.un.org/millenniumgoals/# Accessed on 3.06.2011.

World Health Organization, Global Tuberculosis Control 2009: Epidemiology, Strategy, Financing: WHO report 2009, World Health Organization, Geneva, Switzerland, 2009. Available from http://www.who/gtc/2009 accessed on 8.04.2015.

****