A study of reasons for delay in diagnosis of tuberculosis amongst newly diagnosed pulmonary tuberculosis patients

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Abstract

Background: Tuberculosis (TB) is a major infectious killer especially in developing country like India because of its peculiar socio-economic and demographic diversity. The delay in diagnosis poses a greater increase in morbidity and mortality leading to further complicating the TB situation in our country. **Aims and objectives:** To study reasons for delay in diagnosis of tuberculosis amongst newly diagnosed pulmonary tuberculosis patients. **Methodology:** A cross sectional, descriptive study of sputum smear positive 100 patients, who were interviewed by using a predesigned questionnaire. The data obtained is then statistically analysed. **Results:** The significant risk factors independently associated with patient delay were: age >60 years (p<0.05), female sex (p<0.05), illiteracy (p<0.05), unemployment (p<0.05), place of first presentation being private health facility (p<0.05), following traditional treatment with home remedies and over the counter drugs (p<0.05) and an unsatisfactory knowledge score about tuberculosis (p<0.05). Also the significant risk factors independently associated with health system delay were: female sex (p<0.05), place of first presentation being private health facility (p<0.05), and cough being the presenting symptom (p<0.05). **Conclusion:** A high degree of tuberculosis among patients presenting with cough of 2 weeks duration and subjecting such patients for sputum microscopy should be a routine practice Early diagnosis and prompt initiation of anti-TB treatment is the key to success for TB disease and its control.
Key words: Diagnosis, Tuberculosis.

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INTRODUCTION

Although Tuberculosis (TB) is a preventable and curable disease, it remains a leading cause of morbidity and mortality. As per Global TB Report 2017, India caters for one fourth of global TB cases with 2.8 lakhs incident cases, out of which 4.3 lakhs people died of the disease and 1.47 lakh people were diagnosed to have Multi-drug resistant TB (MDR-TB)/ Rifampicin- resistant TB (RR-TB). [1] The problem has been again getting worse by the rise in MDR-TB and Extensively drug resistant TB (XDR-TB) globally as well as in India. Early diagnosis and initiation of treatment are essential for an effective TB control programme. Delay in diagnosis is significant to both disease prognosis at the individual level and transmission within the community.

AIM AND OBJECTIVES

To study the various reasons for delay in diagnosis of tuberculosis amongst patients who are newly diagnosed cases of pulmonary tuberculosis.

MATERIAL AND METHODS

A cross sectional, descriptive study of sputum smear positive patients attending TB and Chest Diseases Hospital of Govt. Medical College, Amritsar was performed from 1st June 2011 to 31st May 2012 for a study period of one year after taking approval from ethical committee. The inclusion criterias for the patients under study were as follows:

a) Sputum smear positivity (Newly diagnosed cases of Pulmonary TB)
b) Age >15 years and
c) Duration of symptoms >2 weeks.

A total of 100 patients were interviewed by using a predesigned questionnaire after taking informed consent and strict confidentiality was maintained regarding their identity and responses. The qualitative data thus obtained was tabulated and subjected to statistical analysis using Chi-square test without Yate's correction so as to know the association was significant or not i.e. 'p' value was calculated.

OBSERVATIONS

A total of 100 cases of tuberculosis aged 15 to 72 years attending TB and Chest Diseases Hospital were included in this study to evaluate the health seeking behaviour and to assess their knowledge regarding tuberculosis disease. The observations of the study as tabulated and are as follows.

Table 1: Duration of symptoms before first presentation (Patient delay):

Duration of symptoms	No. of cases	% age
≤1 month	32	32.0
>1 month	68	68.0
Total	**100**	**100.0**

Table 2: Duration from first presentation to the start of treatment (Health system delay)

Duration	No. of cases	%age
≤15 days	32	32.0
>15 days	68	68.0
Total	**100**	**100.0**

Table 3: Type of services obtained at first presentation

Type of services	No. of cases	%age
Referred to other level	45	45.0
Advice only	02	02.0
Other non-ATT drugs given	86	86.0
Sputum taken for examination	36	36.0
X-ray examination	22	22.0
Other tests	29	29.0

Table 4: Patient Delay and its factors among study subjects

Sr. No	Characteristics	≤1 month delay n (%)	>1 month delay n (%)	Total	'p' value
	Age				
1	<60 years	27 (51.92%)	25 (48.07%)	52	
	>60 years	05 (10.42%)	43 (89.58%)	48	**<0.05**
	Sex				
2	Male	16 (42.10%)	22 (57.89%)	38	
	Female	16 (25.81%)	46 (74.19%)	62	**<0.05**
	Educational Status				
3	Illiterate	04 (06.34%)	59 (93.66%)	63	
	Literate	28 (75.68%)	09 (24.32%)	37	**<0.05**
	Occupation				
4	Employed	20 (66.66%)	10 (33.33%)	30	
	Unemployed	12 (17.14%)	58 (80.56%)	70	**<0.05**
	Addictions				
5	Yes	04 (20.0%)	16 (80.0%)	20	
	No	28 (35.0%)	52 (65.0%)	80	>0.05
	Distance to first health facility				
6	<2 km				
	>2 km	28 (33.33%)	56 (66.67%)	84	>0.05

Sr. No	Characteristics			Total	'p' value
		04 (25.0%)	12 (75.0%)	16	
7	Place of first presentation				
	Private hospital	11 (17.19%)	53 (82.81%)	64	**<0.05**
	Govt. hospital	21 (58.33%)	15 (41.67%)	36	
	Major reasons as reported by patients				
	a) Assuming symptoms may disappear by itself				
	Yes				
8	No	28 (29.79%)	66 (70.21%)	94	>0.05
		04 (66.67%)	02 (33.33%)	06	
	b) Following traditional treatment				
	Yes	05 (7.63%)	62 (92.54%)	67	**<0.05**
	No	27 (81.82%)	06 (18.18%)	33	
Total		**32 (32.0%)**	**68 (68.0%)**	**100**	

Table 5: Health system Delay and its factors among the study subjects

Sr. No	Characteristics	≤15 days n (%)	>15 days n (%)	Total	'p' value
1.	Age				
	<60 years	20 (38.46%)	32 (61.53%)	52	
	>60 years	12 (25.0%)	36 (75.0%)	48	>0.05
2.	Sex				
	Males	18 (47.37%)	20 (52.63%)	38	
	Females	14 (22.58%)	48 (77.42%)	62	**<0.05**
3.	Marital status				
	Married	30 (35.71%)	54 (64.29%)	84	
	Single	02 (12.50%)	14 (87.50%)	16	>0.05
4.	Addictions				
	Yes	03 (15.0%)	17 (85.0%)	20	>0.05
	No	29 (36.25%)	51 (63.75%)	80	
5.	Place of first presentation				
	Govt.	28 (77.78%)	08 (22.22%)	36	
	Private	04 (06.24%)	60 (93.76%)	64	**<0.05**
6.	Place where diagnosis is confirmed?				
	Govt.	30 (38.97%)	47 (61.03%)	77	
	Private	02 (08.70%)	21 (91.30%)	23	**<0.05**
7.	Which symptoms made the patients approach the doctor?				
	Cough	27 (28.72%)	67 (71.28%)	94	
	Other than cough	05 (83.33%)	01 (16.67%)	06	**<0.05**
8.	Chronic medical illness				
	Yes	03 (09.09%)	30 (90.91%)	33	
	No	29 (43.29%)	38 (56.72%)	67	**<0.05**
	Total	**32 (32.0%)**	**68 (68.0%)**	**100 (100%)**	

Table 6: Major reasons for patient delay for >2 weeks as reported by patients

Reasons for delay	No. of cases	%age
Assuming symptoms will disappear by itself	94	94.0
Financial constraints	23	23.0
Health facility too far	11	11.0
Work overload	56	56.0
Absence of transportation	03	03
Following traditional treatment	67	67.0
Afraid of long processes in health facilities	43	43.0

Table 7: Average number of days of delays among Study Subjects

Type of Delay	No. of Days of Delay		
	Mean (SD)	Median	Range
Patient Delay	44 (16.02)	45	20-90
Health System Delay	23 (10.7)	30	0-45
Total Delay	**67 (16.88)**	**45**	**20-135**

DISCUSSION

The morbidity and mortality associated with TB disease can be greatly minimized with the early detection of the disease and timely institution of the anti-tubercular treatment (ATT). The duration of infectiousness of an incident infectious case is of crucial importance with regard to the risk of the general population becoming exposed to such a case. If these cases were not detected and placed on adequate chemotherapy, a large proportion would remain who would still be susceptible to new infection.[2] The Global Plan to Stop TB addresses the new challenges of the intersecting epidemics of TB and HIV, and it aims to cut the transmission chain by achieving early and effective treatment of all people with TB infection.[3] The Directly Observed Treatment Short-course (DOTS) strategy, recommended by the World Health Organization (WHO) for the prevention and control of TB, relies on passive case finding by sputum smear microscopy.[4] A smear positive pulmonary TB case infects 10-12 normal individuals per year, thus delay in diagnosis of TB fosters spread of infection. The total delay comprises of components of patient delay and a median component of health system delay. The patient delay comprises of the interval between onset of symptoms and seeking health care whereas the health system delay comprises of median number of days between first contact with the health care provider and being put on treatment. In our study cough was the predominant symptom present in 94.0% cases. Fever and loss of appetite was also present in 80.0% and 78.0% cases respectively. The first consultation of 64.0% tuberculosis patients was with the private practitioners. The rest (36.0%) visited government health centre. No patient was presented to traditional healer. These findings were in accordance with findings from many other studies in India and abroad.[5,6,7] The factors influencing study subjects to first contact government or private health facilities were as follows:

- As the age increased, proportion of subjects consulting private facilities was more, but not statistically significant ('p' value >0.05)
- Females have preferred private facilities (67.74%) over government facilities when compared with males (57.89%), but not statistically significant ('p' value >0.05).
- Higher the educational status, higher is the proportion of them going to private health facility (86.49% Vs 50.79%; p<0.05).
- Single subjects approached private facilities more as compared to those who were married (87.50% vs. 59.52; p<0.05).
- Patients with history of addiction to alcohol and smoking approached private facilities significantly more when compared with non-addicts (75.0% Vs 20.0%; p<0.05).

Out of total 100 patients who were asked the reasons why they reached the health centre late, 94 (94.0%) mentioned that they were assuming that symptoms will disappear by themselves in due course, out of which 70.21% had a longer patient delay. The association was not significant ('p' value > 0.05). The next most common reason mentioned was that the patients were following the traditional treatment with home remedies and over the counter drugs (67.0%), out of these 92.54% had a patient delay of more than 1 month. The association being significant (p <0.05). The other reasons being work overload (56.0%), afraid of long processes in health facilities (43.0%), financial constraints (23.0%), health facility too far (11.0%) and absence of transportation to report to the health facility (03.0%). More number of elderly patients (89.58%) had delay of >1 month in reporting to the first health facility (patient delay) as

compared with the middle aged (53.33%) and young (31.82%). The association was found to be significant ('p' value <0.05). Also it was found that as the age increases the time taken for the start of treatment from diagnosis (health system delay) increases. Thus the health system delay of >15 days was seen in elderly (75.0%) and middle aged (73.33%) as compared to the younger ones (45.45%). The association was not significant ('p' value >0.05%). Bhushan B. *et al* found that the respiratory symptoms, such as cough and sputum production (p<0.05), are significantly less frequent among elderly patients and the longer median duration of symptoms prior to diagnosis seen in the elderly may be because the elderly tolerate symptoms for longer periods before seeking medical advice, or are neglected by the family.[8] Our study showed a preponderance of females (62%) over the males (38%). More number of female patients (74.19%) had >1 month of patient delay than males (31.58%). This difference in gender was also seen in health system delay, females (77.42%) having more delay than males (52.63%). The association was significant ('p' value <0.05). It may probably due to some element of neglect towards females in some Indian families. The educational status showed a significant association for longer patient delay (p<0.05). 93.66% of illiterates had a delay of more than 1 month in seeking care. Illiterates were observed to have significant association with patient delay in studies done at Tamil Nad[5] and New York.[9] Unemployed patients (80.56%) showed significant association with patient delay (p<0.05). Generally heavy alcohol drinkers have neglect health behaviour, as an extension of this they do not seek timely medical help. This is reflected in our study, as the duration and proportion of delay was more among alcoholics. 84.0% of the present study population had health facility within 2 km of their residence. There was no significant association observed between distance >2 km to first health facility from subjects residence and patient delay. More proportion of patients had diagnosis delay if they had first contacted a private provider as compared to Govt. health provider. (patient delay of 82.81% Vs 41.67% and health system delay of 93.76% Vs 22.22%) which was found to be statistically significant (p <0.05). First seeking a private practitioner was a clear risk factor for diagnostic delay in studies done in Ghana[10], Nepal[11], Nigeria[12] Cough as a presenting symptom was significantly associated with a longer health system delay as compared to symptoms other than cough (71.28% Vs 16.67%; p<0.05). Being the prime symptom of respiratoty system it is invariably present in many lung conditions and thus can mislead treating physicians causing delay in diagnosis of TB. Patients were interviewed for the type of services obtained at the first presentation which showed

92.0% patients received non anti-tubercular drugs with only 36.0% being subjected for sputum microscopy. Also chest X-ray was advised to only 22.0%. The use of fluroquinolone antibiotics may mask the symptoms and cause a delay in diagnosis of tuberculosis. The patient delay comprising of the interval between onset of symptoms and seeking health care, varied from a minimum of 20 days to maximum of 90days with a median of 45 days and a mean (SD) of 44 (16.02) days of delay. Patient delay contributed more than provider delay to the total time to diagnosis in our context. The health system delay was in the range of 0-45 days, the mean (SD) being 23 (10.7) days. In multivariate analysis, the significant risk factors independently associated with patient delay were: age >60 years (p<0.05), female sex (p<0.05), illiteracy (p<0.05), unemployement (p<0.05), place of first presentation being private health facility (p<0.05), following traditional treatment with home remedies and over the counter drugs (p<0.05) and an unsatisfactory knowledge score about tuberculosis (p<0.05). In multivariate analysis, the significant risk factors independently associated with health system delay were: female sex (p<0.05), place of first presentation being private health facility (p<0.05), and cough being the presenting symptom (p<0.05).

CONCLUSION
Thus from the present study it can be concluded that poor socio-economical status, illiteracy and stigma associated with the disease; resulting in a poor knowledge about the tuberculosis are the route causes for the delay in presentation to the health facility. Elderly patients (>60 years), female gender and unemployment are the significant risk factors for the patient delay. A high degree of tuberculosis among patients presenting with cough of 2 weeks duration and subjecting such patients for sputum microscopy should be a routine practice.

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