Diagnostic and Treatment Delays among the Tuberculosis Patients in the Urban Area of Western Nepal

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ABSTRACT

Background

Diagnosis and treatment of tuberculosis is vital for health system to identify, treat patients as early as possible and to reduce frequency of new cases of a disease among the contacts of known cases.

Objective

To determine the diagnostic and treatment delay in the urban population of the western, Nepal and factors associated to it.

Method

An institutional based cross-sectional study was conducted in urban area of Western Nepal. Category I 142 TB patients aged over 15 years visiting DOTs centre during period of three months were included in study. Interview schedule was designed to elicit information on socio- demographic characteristics and history of symptoms. Diagnostic and treatment delay was calculated, chi square test was applied to find associations and non – parametric tests (Mann Whitney U test and Kruskal Wallis H test) for evaluating group differences.

Result

Out of 142 TB clients, mean age was 38.12 years. Majority (58%) were males. Around 44% belong to upper, 30% middle and 26% lower economic class. Study showed median diagnostic delay 34 days (Q_3=68 Days, Q_1=19 Days), treatment delay less than a day (Q_3=1 Day, Q_1=0 Day) and total delay 33.50 days (Q_3=71 Days, Q_1=19 Days). Smear positive patients had significantly higher risk of diagnostic delay compared to negative (OR=2.18. P=0.035). However, no significant associations found between socio-economic/demographic classes with delay. Median delays was more amongst married (Q_3=86 Days, Median =72 days, Q1=24 Days compared to single/separated (Q_3=74 Days, Median =57 days, Q_1=15 Days) and other socio-demographic variables had no significant differences.

Conclusion

Delay in diagnosis and treatment in Urban region of Western, Nepal was shorter compared to other places in Nepal and neighboring countries. Shorter delay for smear negative pulmonary tuberculosis raises doubt that cases are not examined according to the national TB control programs manual.

KEY WORDS

Diagnostic delay, DOTS, Treatment delay, Tuberculosis

INTRODUCTION

Tuberculosis (TB) is a problem of global importance, among communicable diseases which is the second leading cause of death worldwide, killing nearly 2 million people each year.[1] During 20th century, it remains a world-wide public health problem in spite of advances in science and availability of highly effective drugs beside it.[2]

Delayed in presentation is a major problem contributing to the high burden and transmission of TB in most developing countries which spreads the infection in the community, increases severity of the disease and is associated with higher risk of mortality.[3,4] The directly observed treatment with short course (DOTS) strategy of the national TB control programs (NTP) emphasizes passive case finding which could result in a delayed diagnosis itself. Identifying reasons for delay in diagnosis and treatment of tuberculosis is important for the health system to find ways to treat patients as early as possible, and hence reduce the suffering of patients and transmission of the disease.

The following study aims at determining the diagnostic and treatment delay in the urban population of the western, Nepal and factors associated to it.

METHODS

The study was conducted in Western region of Nepal, Pokhara Sub-metropolitan with the population of approx. 0.4 million. This is one of the second biggest cities in the country after capital city Kathmandu.

A descriptive cross-sectional survey was conducted to determine the duration of delay in the diagnosis and treatment of tuberculosis and its associated factors.

The study population were registered category I tuberculosis cases above 15 years of age. The cases were of registered at DPHO/DOTS kaski during the data collection period. All the clients were taken from 12 service centres of Pokhara, 147 clients were receiving service during the data collection period, among them, 142 patients were covered and other 5 patients were impossible to cover. Relapse cases were not studied. Structured interview schedule was designed. Information on socio-demographic characteristics and onset of symptoms were collected after informed consent of patients. Interview was conducted with tuberculosis patients coming to collect their drugs at any stage of their treatment under National Tuberculosis Programme during November to December, 2013 at DOTS treatment centers.

Collected data was entered in Excel. Data was entered by two person and checked later to avoid the interpersonal error. Data was analyzes using SPSS-16th Version. Median diagnostic and treatment delay was calculated using the descriptive statistics. Days below the median (33.5 days) was considers as non-delay and above and equal (33.5 days) was delayed. Chi square test was applied to find associations between determining factors (socio-demographic/economic characteristics, utilization of health system and type of tuberculosis) and delays. Unadjusted odds ratio was calculated. For evaluating group differences in the median delay was calculated using Non – parametric tests (Mann Whitney U test and Kruskal Wallis H test) as the data was not normally distributed.

In this paper we used the following operational definitions: Diagnostic delay is the time interval from the appearance of the first symptoms of tuberculosis until the diagnosis of the tuberculosis at any formal health care facility (health centers, hospitals or DOTS centers). Treatment delay is the time interval from the diagnosis and the date of beginning of treatment. Total delay is the sum of diagnostic delay and treatment delay.[5,6] A case of tuberculosis is a patient in whom tuberculosis has been confirmed by bacteriology or diagnosed by a clinician.[7] A case of sputum smear positive pulmonary tuberculosis is a patient with at least two initial positive sputum smears, or one sputum smear positive plus radiographic abnormalities consistent with active pulmonary tuberculosis as determined by a clinician; or one sputum specimen positive plus culture specimen positive for *Mycobacterium tuberculosis*. A sputum smear negative pulmonary tuberculosis case is a patient diagnosed with pulmonary tuberculosis by a clinician not meeting the above criteria for smear-positive disease. A case of extra pulmonary tuberculosis is a patient with tuberculosis of organs other than the lungs. A “new case” is a patient who has never had treatment for tuberculosis or who has taken anti-tuberculosis drugs for less than one month.7

Table 1. Characteristics of the study population

Gender	Frequency (N=142)	Percentage
Male	83	58.5
Female	59	41.5
Age in years		
15-24	51	35.9
25-44	38	26.8
45+	53	37.3
Marital status		
Married	76	53.5
Single/Separated	66	46.5
Caste of the respondents		
Disadvantaged groups	49	34.5
Advantaged groups	93	65.5
Religion		
Hindu	100	70.4
Non- Hindu	42	29.6
Socio-economic class		
Upper class	63	44.4
Middle class	42	29.6
Lower class	37	26.1

RESULTS

Table 1 shows the characteristics of the study population. A total of 129 tuberculosis patients were only interview in the study of 142 registered patients at DPHO. Male constituted higher percentage 58.5% of the participants. The mean age was 38.12 (SD 19.11) Years. Around 44% of the population was high class followed by 30% of the middle class. Majority (65.5%) were from the advantageous caste group. Around 54% of the respondents were married and rest either unmarried/separated. Among them, 80 (62.01%) participants had sputum smear positive pulmonary tuberculosis, 49 (37.99%) had sputum smear negative tuberculosis.

The median diagnostic delay days were 34 days with minimum 6 days to maximum 355 days. Similarly, the median treatment delay was less than a day with maximum 9 days. Overall, the total median delay was 33.50 days (Q_3=71 Days, Q_1=19 Days). Similarly, among them around 46.5% had delayed in their diagnosis.

Table 2. Factors associated with the diagnostic delays

Characteristics	Diagnostic Delay (N= 60)	Delays Non-delay (N=69)	Total (N=129)	Chi-square	P-value
Age					
15 – 24	17	29	46		
25 – 44	15	20	35	4.572	0.102
45+	28	23	48		
Gender					
Male	37	38	75	0.573	0.449
Female	23	31	54		
Caste					
Disadvantaged groups	19	28	47	1.101	0.294
Advantaged groups	41	41	82		
Marital status					
Married	37	31	68	3.608	0.058
Single/ Separated	23	38	61		
Religion					
Hindu	44	46	90	0.676	0.411
Non-Hindu	16	23	39		
Socio- economic status					
Upper class	28	31	59		
Middle class	18	20	38	0.131	0.937
Lower class	14	18	32		
Forms of TB					
Smear Positive	43	37	80	4.436	0.035*
Smear Negative	17	32	49		

*Statistically significantly with diagnostic delay

Table 2 shows the association of between the variables and diagnostic delays. Smear positive patients had significantly higher risk of diagnostic delay compared to negative (OR=2.18, (CI 1.82-2.37) P=0.035). However, no significant associations were found between age (P=0.102), sex (P=0.449), caste (P=0.294), marital status (P=0.058), religion (P=0.411) and socio-economic status (P=0.035) with diagnostic delay.

Similarly while comparing the group differences in the median delays using the non parametric tests ((Mann Whitney U test and Kruskal Wallis H test) Median delays was more amongst married (72 days) as compared to single/separated (57 days) and other socio-demographic (age, religion, socioeconomic status, caste) variables had no significant differences.

DISCUSSION

This study aimed to estimate magnitude of diagnostic and treatment delay among TB patients under DOTS. The types, influencing factors and days of delay vary from country to country which might be due to study methodologies used and also the differences in socio – economic status, health seeking behavior of patients, availability and accessibility of health services.

In the current study median diagnostic delay was 34 days. Shorter median patient delay was reported from South India (20 days), and longer patient delay was reported from Sunsari (42 days), Banke (50 days), Ethiopia (60 days) and Tanzania (120 days).[5,8-11] In this study, the median diagnostic delay was found as 34 days which was similar to a study compared to the median delay 33 days reported from Punjab, Pakistan.[12]

The differences could be because of variation in the definition of patient delay and selection of the study population. Our definition of patient delay is the time interval between the first symptom of tuberculosis and the first visit to “any formal health care facilities”, whereas some references defined it as “any health facility”. We have included sputum smear positive, sputum smear negative and extra pulmonary tuberculosis. Some studies included sputum smear positive pulmonary tuberculosis only and others included pulmonary tuberculosis and very few studies included extra pulmonary patients.[9]

On the other hand, the treatment delay found in this study was less than a day which was similar compared to the study conducted in Sunsari, Nepal. This could be due to improved laboratory diagnosis of sputum smear test at the health institutions.[5] In the same way, a study conducted at Ethiopia was only one day, which was concerning to same when contrasted to our study.[10] The longer treatment delay was reported from south India 23 days, which was very high than this study.[8] Treatment delay is mainly due

to health care facilities. It may be due to lack of availab ility of trained staff, lack of quality of services, lack of drugs and lack of effective supervision.

The median total delay in our study was found to be 33.5 days which was partly less compared to a study conducted at Ethiopia which was 70.5 days.[10] In the current study, patients' delay was a major contributor to the total delay.

Sputum smear negative pulmonary tuberculosis patients had significantly lower risk of patient delay in our study, which was similar to the study conducted in Sunsari, Nepal.[5] Sputum smear positive pulmonary tuberculosis patients had shorter health system delay compared to smear negative in Ethiopia, Southern Taiwan and London.[10,13,14] The types of delay, influencing factors and days of delay vary from country to country which might be due to study methodologies used and also the differences in socio-economic status, health seeking behaviour of patients, availability and accessibility of health services. The study found no significant differences in diagnostic delay with socio-demographic variables such as: age, sex, caste, religion and socio-economic class. The median diagnostic delay of tuberculosis in this study was shorter compared to previous study conducted at Sunsari and Banke, Nepal.[5]

This study explored the delay for treatment of TB patients that is caused by diagnosis and health system delay. However, it is confined in urban setting of Nepal and is limited within patients getting treatment through DOTs approach. As it's very difficult for patients to remember the appropriate date of onset of symptoms of disease there exists the chance of recall bias in the study.

CONCLUSION

Median diagnostic delay was found to be 34 days and treatment delays to be less than a day in the urban area of Western, Nepal. Median total delay was found to 33.5 days. Smear positive tuberculosis patients have longer delay than smear negative patients and other socio- demographic/ socioeconomic factors seem to have no association with the delays. This is one of the few researches in Nepal which attempt to determine the time required for initiation of treatment since onset of TB symptoms.

The study urges for need of community based early disease diagnosis system that even takes vulnerable groups and communities in consideration.

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