**BRIEF COMMUNICATION**

# PATIENT AND HEALTH SERVICE DELAY IN THE DIAGNOSIS AND TREATMENT OF PULMONARY TUBERCULOSIS: THE SITUATION AT A TEACHING AND REFERRAL HOSPITAL IN NORTHWEST ETHIOPIA

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## ABSTRACT

***Background:*** *Delay in the diagnosis and treatment of Pulmonary Tuberculosis (PTB) causes severe disease and higher mortality. It also leads to an increased period of infectivity and transmission in the community.*

***Objective:*** *The main aim of this study is to determine patient and health service delay in the diagnosis and treatment of patients with pulmonary tuberculosis.*

***Methods:*** *A cross sectional study was conducted at the DOTS Clinic of the University of Gondar Hospital and all adult pulmonary tuberculosis patients who came to the DOTS Clinic for a period of six months were included. Data collection was done through interview of pulmonary tuberculosis patients and review of their medical records.*

***Results:*** *Two hundred twenty-two eligible adult TB patients were recruited into the study. Of those who were enrolled, 48.6% were male, 57.2% married, 9.5% unemployed, and 66.2% with no formal education. The mean age was 34 (SD=12), with a median age of 30 years. The mean duration of illness was 5.7 months, with a median and an interquartile range of duration of illness of 4 months and 2-8 months, respectively. The majority of the study participants (72.1%) sought medical advice first at health centers, followed by private clinics (14%), then referral hospitals (7.2%). At the study hospital, the mean duration between consultation with the doctor and start of treatment was 7 days. When asked why they delayed visit of the study hospital, 38.7% of the patients mentioned shortage of money, and 8.1% said distance of health care facilities from home were the reasons.*

***Conclusion:*** *Patient delay contributes significantly to delays in patients accessing treatment. Therefore TB control programmes in the catchment area must emphasise patient education regarding symptoms of tuberculosis and timely health seeking behaviour. Continuing medical education about TB management procedures for health providers is also suggested.*

## INTRODUCTION

Tuberculosis (TB) is an ancient disease which continues to pose a major public health challenge in developing countries. Currently one-third of the world's population is infected with tubercle bacilli, and out of this, 90% are in developing countries (1).

In 2007, WHO estimated that 80% of tuberculosis cases worldwide were found in 22 high burden countries. Ethiopia is one of the high burden countries ranking 7$^{th}$ in the world, with an estimated 314,267 cases in 2007, an incidence rate of 378 cases per 100,000 population (1).

Delay in the diagnosis of TB and commencement of treatment has been reported to be common in Ethiopia and other countries (2-5). This delay is attributable both to patients and health workers (6). Delay in diagnosis may worsen the disease, increase the risk of death, and enhance tuberculosis transmission in a community (7). In addition, in countries with high burden of HIV like Ethiopia, delay in diagnosis is an important contributor to the excess morbidity and mortality. Delay in the diagnosis of TB in HIV-infected individuals has a greater impact on mortality and morbidity when compared with HIV-uninfected individuals (8). The multiple factors causing delay in diagnosis must be clearly identified and addressed in order to improve the quality and effectiveness of local TB control programmes.

This study was conducted at the University of Gondar Hospital to determine patient and health care provider delays in the diagnosis and treatment of pulmonary TB.

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## METHODS

***Study Design:*** A cross-sectional survey was conducted to retrospectively assess the duration of delay in the diagnosis and treatment of pulmonary TB.

***Study Area:*** The study was conducted at the DOTS Clinic of the University of Gondar Teaching and Referral Hospital which was established in 1999. Patients who were examined, investigated, and diagnosed to have TB are routinely sent to this clinic to have directly observed therapy for TB. The attendants of bed-ridden patients and inpatients come and collect the drugs at the clinic, and nurses regularly go to the wards for supervision. All forms of TB receive service at this clinic. Patients who cannot not attend their treatment in this clinic regularly are referred to their nearby clinics.

***Sampling:*** New pulmonary TB patients coming to the DOTS Clinic were selected consecutively within six months of the study period. Pulmonary TB patients with asthma and other Chronic Obstructive Pulmonary Diseases (COPDs) were excluded from the study because of difficulty in accurately delineating the duration of symptoms actually caused by TB. Moreover, retreatment cases were not studied.

***Data Collection:*** Interviewer administered closed-ended questionnaire, translated to the local language (Amharic) was used for data collection (March – August 2006). The medical record was also reviewed for type of TB, smear positivity, and the presence of additional diagnoses. Variables like age, sex, educational status, income, family size, presence and characterization of cough, presence of symptoms of TB, and medical history of the patients were included in the questionnaire. The interview was conducted by two trained nurses.

***Data Management:*** Data were entered and analysed using EPI Info 2000 and descriptive statistics were used to summarise the findings. Measures of central tendency, dispersion, and statistical tables were used to depict the findings.

***Operational Definitions:***
In this paper the following operational definitions are used.

*Duration of illness* is the time interval between the start of symptoms of the illness and the time when the patients were encountered at the DOTS Clinic for interview.

*Patient delay* is the time interval from the appearance of the first symptoms of tuberculosis until the first visit to any formal health care facility (i.e., health centers, clinics, hospitals). There is patient delay if a patient visits health institutions 30 or more days after the onset of symptoms.

*Hospital delay* is the time from arrival at the hospital until the patient is seen by a doctor.

*Treatment delay* is the time between first consultation with a doctor and start of anti-TB treatment.

*Total delay* is the sum of patient delay, hospital delay, and treatment delay.

***Ethical Considerations:*** The study was approved by the Institutional Review Board of the University of Gondar. Informed verbal consent was obtained from each participant. Confidentiality of the information obtained from the patients was protected by not writing the name of the patient on the questionnaire and restricting access to the data to the researchers only.

## RESULTS

### *Socio demography*

Two hundred twenty-two eligible adult TB patients were recruited into the study. Out of those enrolled, 48.6% were male, 57.2% were married, and 66.2% had no formal education. The mean age was 34 (SD=12), with a median age of 30 years. The mean family size was 4 (SD = 2.3) with a range of 1–12. (Table 1)

### *Duration of illness*

The majority of the patients came with a combination of symptoms. The most frequently reported symptoms included fever (96.8%), weight loss (96.4%), night sweating (91%), loss of appetite (84.2%), chest pain (70.7%), cough (65.8%), and hemoptysis (11.7%).

The mean duration of illness until treatment initiation was 5.7 months, with a median and an inter-quartile range of 4 months and 2-8 months, respectively. Seventy-five percent of the patients had duration of illness of more than 2 months, and in 25% of the patients the illness lasted more than 8 months. Only 34 (15.4%) of the patients presented with illness duration of less than a month (Table2)

**Table 1: Socio- demographic characteristics of tuberculosis patients, the University of Gondar Teaching Referral Hospital, January 2007–June 2007.**

| Characteristic | Frequency (%) |
|---|---|
| Sex | |
| Female | 114(51.4%) |
| Male | 108(48.6%) |
| Marital status | |
| Married | 127(57.2%) |
| Single | 43(19.4%) |
| Divorced | 33(14.9%) |
| Widowed | 19(8.6%) |
| Religion | |
| Orthodox | 214(96.4%) |
| Muslim | 5(2.3%) |
| Other | 2(0.9%) |
| Protestant | 1(0.5%) |
| Ethnicity | |
| Amhara | 221(99.5%) |
| Tigrie | 1(0.5%) |
| Education status | |
| Cannot read and write | 104(46.8%) |
| Read and write | 44(19.8%) |
| Elementary school | 31(14%) |
| Secondary school | 35(15.8%) |
| Above 12 | 8(3.6%) |

**Table 2: Duration of illness and symptoms among tuberculosis patients at the University of Gondar Teaching Referral Hospital**.

| | *Mean (months)* | *Median (months* | *Inter-quartile Range (months)* |
|---|---|---|---|
| Total duration of illness | 5.7 | 4 | 2 to 8 |
| **Symptoms** | | | |
| Cough | 6.5 | 4 | 2 to 8 |
| Fever | 5.75 | 4 | 2 to 8 |
| Night sweating | 5.6 | 4 | 2 to 7 |
| Hemoptysis | 3.1 | 2 | 0.5 to 6 |
| Chest pain | 4.9 | 3 | 2 to 6 |
| Loss of appetite | 5.3 | 4 | 2 to 7 |

***Place of first consultation***

The majority of the study participants sought medical advice first at health centers (72.1%), followed by private clinics (14%), and referral hospitals (7.2%) (Table 3). The duration of illness was investigated for patients in relation to the health facilities they visited first. Longer duration of illness was found for patients who first visited health centers or health posts. Table 4 summarizes the mean and median duration for each of the first visited health facilities mentioned above.

**Table 3: Tuberculosis patients by first visited health facility**

| First Seen Health Institution | Frequency | Percent |
|---|---|---|
| Health Center | 160 | 72.1 |
| Private Clinic | 31 | 14.0 |
| Referral Hospital | 16 | 7.2 |
| Health Post | 8 | 3.6 |
| District Hospital | 7 | 3.2 |
| **Total** | 222 | 100.0% |

**Table 4: Total duration of the disease by type of first facility visited (months)**

| Facility first visited | N | Duration of illness (months) | |
|---|---|---|---|
| | | Mean | median |
| Health Center | 159 | 6.5 | 4 |
| Health Post | 8 | 7 | 6 |
| Private Clinic | 31 | 3.5 | 2.5 |
| Referral Hospital | 16 | 3.4 | 2.5 |
| District Hospital | 7 | 2.1 | 2 |

## *Treatment delay*

An average duration of 2 days was required to see a doctor after arriving at the hospital.

The mean duration between consultation with the doctor and start of treatment was 7 days, and the median treatment delay was 5 days from first contact with the doctor. Table 5 summarizes the mean and median delays at all stages between onset of symptoms and start of DOTS treatment.

**Table 5: Delay for tuberculosis patients at different stages from onset of symptoms to start of treatment at University of Gondar Teaching Referral Hospital, January- June 2007.**

| *Variable* | *Mean (SD)* | *Median* | *IQR ($25^{th}$-$75^{th}$)* |
|---|---|---|---|
| Patient delay (days) | 147 (160) | 90 | 45-180 |
| Hospital delay (days) | 2(1.8) | 2 | 0-3 |
| Treatment delay (days). | 7 (7.5) | 5 | 3-8 |
| Total duration of illness until treatment initiation (months). | 5.7 (5.7) | 4 | 2-8 |

### *Patient delay*

The mean duration between onset of symptoms and first health care visit was 147 days, and the median was 90 days. Patient delay was observed to be more than 30 days in 76.6% of the patients.

### *Reason for Delayed Health Care Visit*

When asked why they delayed visits, 38.7% of the patients mentioned shortage of money, and 8.1% stated distance of health care facilities from home as reasons. Another 32.4% hoped that symptoms would resolve without treatment.

## DISCUSSION

This study reflects that generally there is a much pronounced delay before a pulmonary TB patient gets diagnosed and treated. Much of the delay is from the onset of symptoms until a diagnosis of tuberculosis. Given the lack of a standard definition for delay, our cutoff of 30 days was adopted from a similar study by Demissie (2) and Mesfin (5) in Ethiopia.

In this study, the mean patient delay was 147 days (median 90 days). Patient delay found in this study is similar to findings from previous studies in Ethiopia (12), Tanzaina (13), Burkina Faso (14) and Ghana (15), but contrary to findings from another study in Ethiopia(2, 4, 5). Late patient presentation was a more important contributor to total delay in commencing treatment than doctor delay. In addition to shortage of money and poor accessibility of healthcare institutions, the delay by patients may also be due to low level of knowledge and awareness of the disease and lack of information about availability of free treatment. There is a need to increase awareness of tuberculosis among the population.

On the other hand, nearly three-fourths of the patients in this study had their first visit to health centers which are actually less equipped than hospitals in terms of the quality and quantity of health care providers in this country. That might have contributed a lot to delaying most of the patients. The data have shown that longer duration of illness was observed in patients who had their first visit to health centers and hospitals. Improvement of health care service at health centers, health posts, and in rural areas in general, might contribute a lot to averting this problem (16, 17).

According to the results of this study, hospital delay is relatively short. About 65% of the patients have visited their physicians within two days after arriving at the hospital. However the professional delay was a little longer. Only 25% of the cases are put on DOTS in less than three days. About 5% started DOTs after waiting for more than 95 days. The shorter hospital delay observed in this study contrasts with findings in Tanzania (13) and South Africa (18).

Though most patients were seen by physicians in two days, a median duration of seven days from the time the patient was seen by a physician till the start of treatment can still be improved by facilitating patient flow to different departments of the hospital. Most of the delays in hospital until treatment is started are due to poor functioning of health institutions leading to slower patient flow (19).

The main limitation of this study is the possible recall bias of patients regarding the type and onset of symptoms.

## CONCLUSION AND RECOMMENDATIONS

This study is valuable for improving the quality of services and strengthening the objectives of disease control. It highlights the importance of improving referral systems and access to diagnostic facilities for TB if one wishes to reduce the transmission of TB in the community. It also shows the importance of increasing the awareness of the signs and symptoms of TB among the general public and working closely with health care providers at all levels, including pharmacists, other drug sellers, and traditional healers.

Patient delay contributes significantly to delays in patient accessing treatment. Substantial reduction in case detection delays may be achieved through more specific and effective health education to the general public on tuberculosis and seeking of appropriate medical consultation, continuing medical education about TB management procedures for health providers. A similar research in the area could serve as a basis for monitoring improvement in the quality of tuberculosis control programs in Ethiopia.

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## REFERENCES

1. WHO. Global Tuberculosis Control Report: Epidemiology, strategy, financing; 2009.
2. Demissie M, Lindtjorn B, Berhane Y. Patient and health service delay in the diagnosis of pulmonary tuberculosis in Ethiopia. BMC Public Health. 2002;2:23-23.
3. Gele AA, Bjune G, Abebe F. Pastoralism and delay in diagnosis of TB in Ethiopia. BMC Public Health. 2009;9:5-5.
4. Yimer S, Bjune G, Alene G. Diagnostic and treatment delay among pulmonary tuberculosis patients in Ethiopia: a cross sectional study. BMC Infectious Diseases. 2005;5(1):112-112.
5. Mesfin MM, Newell JN, Walley JD, Gessessew A, Madeley RJ. Delayed consultation among pulmonary tuberculosis patients: a cross sectional study of 10 DOTS districts of Ethiopia. BMC Public Health. 2009;9:53-53.
6. Sherman LF, Fujiwara PI, Cook SV, Bazerman LB, Frieden TR. Patient and health care system delays in the diagnosis and treatment of tuberculosis. The International Journal of Tuberculosis and Lung Disease. 1999;3(12):1088-1095.
7. Paynter S, Hayward A, Wilkinson P, Lozewicz S, Coker R. Patient and health service delays in initiating treatment for patients with pulmonary tuberculosis: retrospective cohort study. The International Journal of Tuberculosis and Lung Disease. 2004;8(2):180-185.
8. Meintjes G, Schoeman H, Morroni C, Wilson D, Maartens G. Patient and provider delay in tuberculosis suspects from communities with a high HIV prevalence in South Africa: a cross-sectional study. BMC Infectious Diseases. 2008;8:72-72.
9. Sreeramareddy C, Panduru K, Menten J, Van den Ende J. Time delays in diagnosis of pulmonary tuberculosis: a systematic review of literature. BMC Infect Dis. 2009;9(91).
10. Storla D, Yimer S, Bjune G. A systematic review of delay in the diagnosis and treatment of tuberculosis. BMC Public Health. 2008;8(15).
11. Ayuo PO, Diero LO, Owino-Ong'or WD, Mwangi AW. Causes of delay in diagnosis of pulmonary tuberculosis in patients attending a referral hospital in Western Kenya. East African Medical Journal. 2008;85(6):263-268.
12. Madebo T, Lindtjorn B. Delay in Treatment of Pulmonary Tuberculosis: An Analysis of Symptom Duration Among Ethiopian Patients. Medscape General Medicine. 1999;1(1).
13. Wandwalo ER, Mørkve O. Delay in tuberculosis case-finding and treatment in Mwanza, Tanzania. The International Journal of Tuberculosis and Lung Disease. 2000;4(2):133-138.
14. Ouédraogo M, Kouanda S, Boncoungou K, Dembélé M, Zoubga ZA, Ouédraogo SM, et al. Treatment seeking behaviour of smear-positive tuberculosis patients diagnosed in Burkina Faso. The International Journal of Tuberculosis and Lung Disease. 2006;10(2):184-187.
15. Lawn S, Afful B, Acheampong J. Pulmonary tuberculosis: diagnostic delay in Ghanaian adults. The International Journal of Tuberculosis and Lung Disease. 1998;2(8):635-640.
16. Mesfin MM. Community Based Directly Observed Treatment Short Course Strategy in Pilot Districts of Tigray: Overview of Baseline Studies. Ethiop. J. Health Dev. 2005; 19(Special Issue)
17. Mahendradhata Y, Syahrizal BM, Utarini A. Delayed Treatment of Tuberculosis Patients in Rural Areas of Yogyakarta Province, Indonesia. BMC Public Health 2008; 8: 393
18. Pronyk R, Makhubele M, Hargreaves J, Tollman S, Hausler H. Assessing health seeking behaviour among tuberculosis patients in rural South Africa. The International Journal of Tuberculosis and Lung Disease. 2001;5(7):619-627.
19. Haraden C, Resar R. Patient Flow in Hospitals Understanding and Controlling it Better. Front Health Serv Manage. 2004 Summer; 20(4): 3-15