Delay in diagnosis and treatment of tuberculosis - A review

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Abstract

Delay between the onset of symptoms, patient's first visit to the health facility, diagnosis and treatment lead to continued suffering by the patient and also contribute to transmission of TB infection in the community. The common causes of such delays and their consequences as observed in various studies are summarized in this review article.

Keywords: Tuberculosis, patient delay, health system delay.

Background

Tuberculosis (TB) is prevalent in many countries especially in developing countries. It is a disease associated with poverty, overcrowding, debilitating disease, drug abuses, smoking, alcoholism, homelessness and immune deficiency. It has become more important with the advent of HIV epidemic. New data from WHO has recorded the highest ever prevalence of multi-drug resistant TB with nearly half a million cases being diagnosed every year\(^1\). The strategy for control of tuberculosis lies in early detection, rapid diagnosis and treatment on the basis of DOTS clinic. DOTS is a comprehensive strategy endorsed by WHO which combines microscopic services to detect TB, uninterrupted supply of anti-TB drugs and direct observation of treatment (DOT) at least for the initial intensive phase of treatment. Late treatment can cause complications and disabilities in patients.

Patient delay is the period between the onset of symptoms (e.g. cough, fever, chest pain, haemoptysis in case of pulmonary TB) and patient's first attendance to a health care facility because of any of these symptoms. Factors for this include cost of care, distance from services, lack of knowledge about TB, poor attitude of health workers.

Diagnostic delay is the time interval between onset of symptoms and diagnosis. Delay in diagnosis can affect disease prognosis at the individual level and enhance transmission of disease within the community. The major factors responsible for delay include HIV, chronic cough due to another co-existing disease, geographical barriers, rural residence, poverty, old age, social stigma, etc.

Treatment delay is the time interval between diagnosis of TB and start of treatment. The core problem of delay in diagnosis and treatment is the vicious cycle of repeated visits at the same health care level resulting in non-specific antibiotic treatment, incorrect diagnosis and failure to access TB services. Three groups of health care providers usually act as sources of this vicious cycle: primary level government health centers which have limited diagnostic facilities and inadequately trained staff, private practitioners with low awareness of TB and unqualified vendors and traditional practitioners.

Health care system delay is the time interval between seeking relief from a health care provider and pulmonary TB treatment. It is caused by health care workers who have a low awareness of TB particularly those who are working outside

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the level of primary level government clinics such as unqualified practitioners of medicine and traditional practitioners. Even in government run facilities delays can occur if staff is poorly trained and only limited diagnostic facilities are available. 

**Total delay** is the time interval between onset of symptoms and start of treatment for TB. This duration is that of the sum of two durations i.e patient delay and health care system delay.

**Risk factors associated with long delays before treatment:**
- Inadequate knowledge of symptoms of TB
- Difficulty to access health care and distance from health care units
- Severity and specificity of symptoms
- Vagueness of symptoms
- Absence of hemoptysis
- Negative smears/ of quality smear microscopy network
- Old age
- Female sex
- Ethnic group
- Alcoholism
- Poverty
- Initial visit to a general practitioner
- HIV
- Extra pulmonary TB
- Beliefs and attitudes
- Initial visit to traditional or unqualified practitioner
- Co-existence of chronic cough and/or other lung diseases
- Repeated visit to the health center at the same level
- History of immigration
- Others: smoking, general poor health etc.

The period before diagnosis and start of treatment is important since most of the disease transmission occurs during this time. A long period before diagnosis has a major contribution for the increased transmission of the disease and needs to be reduced through improving the quality and coverage of the control programme. Case finding among self reporting chest symptoms is recommended by WHO as the primary strategy for detecting TB which is influenced by many factors like the health service coverage, perceived severity of illness, knowledge, social and cultural beliefs. On the other hand active case finding is more expensive, has a lower yield and possibly low patient compliance.

**Review of Related studies**

Data of 853 sputum positive patients were analyzed in a study conducted in London2. The median age was 34 years; 60% of patients were men. A total of 263/842 (31%) patients were white and 267/842 (32%) were black; 542/782 (69%) of patients were born outside United Kingdom. Median delay was 49 days. Univariate analysis showed that factors significantly associated with delay of longer than 49 days until diagnosis or treatment were age, birthplace, sex and ethnic group.

In a study conducted in Pakistan, it was found that average time from onset of initial symptoms to diagnosis and treatment of TB was 120 days3. In 64% of the patients, medical practitioners were responsible for delaying the diagnosis of TB. Loss of weight in 40% and haemoptysis in 21% were the consequences of diagnostic delay. Delay in diagnosis was statistically significant in those patients who consulted private practitioners, and consequences were severe in those patients who consulted late. In a cross-sectional study conducted in Vietnam it was found that median delay was 4 weeks for total, 3 weeks for patient
and 1 week for health care delay. 15% of patients had long total delay of >12 weeks. Independent risk factors (p<0.05) for long total delay were female sex, middle age, remote setting, residence in the northern or central area and initial visit to the private sector. For long patient delay (>6 weeks), these were female sex, belonging to an ethnic minority and living at > 5km distance from a health facility or in the northern area. For long health care delay (>6 weeks), these were urban setting, residence in the central area and initial visit to a community health centre, TB hospital or the private sector.

A study conducted in 700 patients in Ethiopia revealed median patient delay of 60 days. There was no significant difference in socio-demographic factors in those who delayed and came earlier among smear positives. However there was a significant difference in distance from home to health institute and knowledge about TB treatment among the smear negatives. The health service delay was low (median 6 days; mean 9.5days). Delay was significantly lower in smear positives compared to smear negatives. Longer health service delay (delay more than 15 days) was associated with far distances.

The study conducted in Argentina included 243 patients with smear positive pulmonary TB and a mean age of 40 years. The median diagnostic delays were as follows: total delay 62.0 days; patient delay 31days; health service delay 12.5 days. For total diagnostic delay of >60 days, age >50years, dependence on transport to the nearest public health service due to distance and presence of cough were responsible.

The study conducted in Ghana included 100 adults among newly diagnosed smear positive pulmonary TB. The median delay in diagnosis was 4 months, and total delay exceeded 6 months in 44% of patients. Total delay was strongly associated with rural residence (P=0.001). System delay was significantly increased in females, rural patients, and among those needing hospital admissions. Increased doctor delay was strongly correlated with rates of failure to perform sputum microscopy. Lower case detection was seen particularly among private practitioners and rural government institutions.

The study conducted in Australia included symptomatic patients with bacteriologically or histologically proven TB. The median delays were 29 days (all TB cases) and 30 days (smear positive pulmonary TB group). The median health care system delays were 22 days (all TB cases) and 11 days (smear positive pulmonary TB group). There were significant trends towards increasing health care system delays with increase in age and longer residency of migrants in Australia, females and those aged over 45. Common reasons for diagnostic delays of more than 90 days were failure to perform appropriate investigations and misdiagnosis of chest X-rays.

**CONSEQUENCES:**

Delayed diagnosis may result in

- More extensive disease
- More complications - loss of weight and haemoptysis
- Higher mortality
- Extended period of infectivity in the community
- Increased rate of drug resistance in community
- Increased need for referral for in-patient TB treatment.

Increased cost for both to the patient in terms of lost employment and transport cost and to the health care system in terms of additional clinic visits and the need for hospitalization.

**RECOMMENDATIONS**

1. All primary health care physicians in the private and public sector should constantly get update for the diagnosis and treatment of
tuberculosis either through workshops, seminars, continuing medical education (CME) or community oriented medical education.

2. There should be increased collaboration between public and private sectors and improvement in referral from the private to the public health sector.

3. Both public and private health care providers should be educated about national TB control guidelines.

4. Doctors should be familiar with varied manifestations of TB and be highly suspicious of the disease in patients with respiratory symptoms.

5. Need to ensure patient are properly investigated for chronic cough and referred to TB clinics.

6. Investigations like sputum examination and chest X-rays are found to be cost effective and should be ordered as and when required without delay.

7. Additional investigations may be necessary in problem cases where sputum status is negative and in patients with extra pulmonary cases eg. bronchoscopy, tissue biopsy and culture, examination of body fluids for adenosine deaminase, CT scan and endoscopy for gastrointestinal involvement.

8. There is a place for empirical therapy when there is a strong clinical suspicion of TB in absence of bacteriological and histological confirmation.

9. Ignorance of the signs and symptoms of tuberculosis attributing other chest diseases and seeking help from traditional health personnel could be overcome by providing information to the public and encouraging them to seek medical care without any delay and make better use of health care facilities.

10. Decentralization of TB diagnostic and treatment services, for instance by locating services at community health service centres can also help by reducing the cost of transport and reducing the distance to the clinics.

11. Consideration should be given for some active case finding interventions such as contact tracing in the routine programme.

References:


