Treatment pathways of extrapulmonary patients diagnosed at a tertiary care hospital in Delhi, India

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ABSTRACT

Background: In order to put extrapulmonary tuberculosis patients early on treatment, it is important to study pathways, which these patients adopt in for seeking treatment. Materials and Methods: In order to study the treatment pathways of extrapulmonary patients and assess appropriate points for intervention, a cross-sectional study was conducted in chest clinic of a tertiary care hospital in Delhi. Results: Factors associated with longer paths included reason for going to first health facility (nearness and known provider), availing more than one health facilities, presenting symptoms of fever, joint pain, nodular skin swelling and skin lesion. Self-referral to the chest clinic was associated with shorter paths. Lower level of education, occupation, non-serious perception of the disease and visiting five health facilities were significantly associated with patient delay of more than 3.5 weeks. Symptoms of fever, joint pain and skin lesion, visiting private health facility first, availing more than two health facilities and travelling distance of more than 100 km to reach chest clinic were significantly associated with the health facility delay of more than 4.5 weeks. Conclusions: Increasing public awareness, training of private practitioners and capacity building of government facilities will help in reducing delay.

KEY WORDS: Behavior, extrapulmonary, health facility delay, patient delay

INTRODUCTION

In India, pulmonary tuberculosis (PTB) is the most common form of tuberculosis (TB) accounting for 75-90% of all types of TB. Extrapulmonary tuberculosis (EPTB) constitutes 10-15% of TB cases and accounts for more than 50% of all cases of TB in HIV+ patients.[1]

In developed countries, a slower annual decrease in EPTB case counts in comparison to PTB case counts has been reported.[2,3] In India, both pulmonary and extrapulmonary cases notified under Revised National Tuberculosis Control Programme (RNTCP) have increased since 1999. However, the rate of increase of new extrapulmonary cases is more than that of new sputum positive or negative TB cases.[4]

In a study conducted at LRS Institute of TB and Respiratory Diseases, Delhi, EPTB to PTB ratio was found to change significantly from 1:5 at the start in January 1999 to about 1:3.5 in March 2003.[5] This increase in numbers has social and economic consequences in a developing economy.

Studies from other countries have shown that TB patients follow a variety of pathways to seek care, which can lead to delayed treatment.[6] It is also well documented that EPTB is associated with a greater patient and diagnostic delay in comparison to PTB.[7,8] Such studies particularly among EPTB patients are lacking in India.

The present study was conducted to chart the treatment pathways of extrapulmonary patients to assess appropriate points for intervention.

MATERIALS AND METHODS

The study was conducted from December 2008 to April 2010 at the chest clinic of a teaching hospital in Delhi, India. A directly observed treatment short course (DOTS) cum microscopy center is located at the chest clinic catering to a designated population. The chest clinic refers patients to their respective DOTS clinic after diagnosing. 150 newly diagnosed
EPTB patients in the chest clinic were included in the study. A pre-tested semi-structured questionnaire was administered after taking written informed consent from patients, on alternate days in a week. Information was recorded regarding health-care seeking behavior and time delays; time from the onset of symptoms to the first consultation (T1), referral to designated TB health facility (T2), and finally the diagnosis and initiation of treatment (T3). Ethical clearance was taken from the institutional Ethics Committee. Data was entered and analyzed with the help of Statistical Package for the Social Sciences (SPSS) 16.0 (IBM SPSS Statistics, IBM Corporation, Chicago, IL). Appropriate statistical tests were applied.

Definitions used
Delay was defined as time elapsed from:

a. Onset of symptoms to the first consultation at any health facility (patient delay T1).
b. First health facility to referral to a TB facility (referral delay T2).
c. Referral to TB facility till the diagnosis (diagnostic delay T3).

Health facility delay included both referral and diagnostic delay (T2 + T3) and total delay included both patient and health facility delay (T1 + T2 + T3).

RESULTS

Socio-demographic features
Mean age of the participants was 23.2 years (SD = 11.1 year). There were more females 82 (54.7%) than males 68 (45.3%). Median monthly per capita income was Rs. 666.8 (interquartile range [IQR] 412-1000). Maximum subjects were unmarried (88; 58.7%).

40 (26.7%) subjects were illiterate while 45 (30%) were just literate or received primary (studied upto 5th grade) school education (45; 30%).

Majority of the subjects were unemployed (103; 68.7%). Among those who were employed, 16 (10.6%) were daily wage workers and others were involved in small business (6; 4%) or in service (25; 16.7%).

Majority (136; 90.7%) of the participants resided in urban areas. The distribution according to type of area was: Regular colonies (60; 40%), walled city (42; 28%), Jhuggi Jhompdi (JJ) cluster 26 (17.3%), resettlement colony, unauthorized colony (4; 2.7%) each.

Health seeking behavior of the patients
Average number of health facilities visited irrespective of the number of repeated visits were 1.99 (median 2; IQR = 1-2, range 1-5). Median distance travelled to reach chest clinic (TB facility) was 100 km (IQR = 100-400).

Symptoms
Most common symptom, which made patients seek health-care was nodular skin swelling (70; 46.7%) followed by fever (40; 26.7%), chest pain (13; 8.7%), abdominal pain (10; 6.7%), joint pain (7; 4.7%), skin lesion (2; 1.3%), cough, loss of appetite and discharging sinus (1; 0.7% each).

Most common site involved was lymph nodes (96; 64%) followed by pleura (25; 16.7%), abdomen (14; 9.3%), bone/joint (7; 4.7%), skin (5; 3.3%), eye (2; 1.3%) and female reproductive organs (1; 0.7%).

Self-reported reasons for visiting first health-care facility
Maximum patients had first visited a private health facility (86; 57.4%) while 64 (42.6%) visited government health facility first, which included government hospital (57; 38%), dispensary (5; 3.3%) and DOTS center (2; 1.3%).

Reasons for going to any first health facility where nearness (98; 65.3%), cost (17; 11.3%), better quality (11; 7.3%), already on some treatment from the same facility (9; 6%), other family member took treatment from the same facility (4; 2.7%), knew staff working at the facility (7; 4.6%) and others (4; 2.7%).

Most common reason for going to a private facility first was nearness (82; 95.3%) and for government health facility it was also nearness along with perception of better quality (16; 25% each) and low cost (10; 15.6%) by the patients.

Patient care seeking pathways to TB diagnosis
Care seeking pathways were traced from the onset of symptoms to final diagnosis of EPTB at the chest clinic. Thirteen different pathways were identified [Figure 1].

Median patient delay in pathways varied from 1 to 44 weeks [Table 1]. Median health facility delay ranged from 2 to 39 weeks. Overall median total delay in these pathways ranged from 6 to 78 weeks.

Only 18 (12%) patients were referred to chest clinic by a private practitioner while the rest were referred either by another government facility (102; 68%) or by self (30; 20%).

Characteristics of patients who adopted the long paths
Paths were divided into three groups on the basis of median total delay: Less than 9 weeks (shorter paths; group 1), 9-16 weeks (medium length paths; group 2), and above 16 weeks (longer paths; group 3) [Table 2].

Health-care seeking behavior of patients who followed longest paths (group 3) differed from those following medium paths (group 2) as they tend to choose nearest health facility or the one where they knew a provider and consult more than one provider (P > 0.05).

Symptoms of fever, nodular skin swelling, abdominal pain, and joint pain were significantly associated with patients who followed the longer paths (group 3) in comparison to those who followed the shorter paths (group 1) (P = 0.04).
**Figure 1:** Treatment pathways of extrapulmonary patients

**Table 1: Delay and referral to the chest clinic in different pathways**

| Group | Diagram in Figure 1 | No. of patients | Path | No. of health facilities | Mean time (T1T2T3) | Median time (weeks) | Referred to chest clinic by | T1 | T2 | T3 | T1T2T3 |
|-------|---------------------|-----------------|------|--------------------------|--------------------|-------------------|---------------------------|----|----|----|--------|
| 1     |                     | 1               | P1-DOTS-chest clinic | 2 | 6.00 | 1 | 5 | 6 | 0 | 0 | 1 |
|       |                     | 1               | Dispensary-chest clinic | 1 | 8.00 | 4 | 4 | 8 | 0 | 1 | 0 |
|       |                     | 2               | DOTS-G1-chest clinic | 2 | 8.00 | 5 | 3 | 8 | 0 | 0 | 2 |
| 2     |                     | 14              | P1-P2-G1-chest clinic | 3 | 11.5 | 2 | 7 | 9 | 2 | 3 | 9 |
|       |                     | 49              | G1-chest clinic | 1 | 16.35 | 6 | 3 | 10 | 2 | 45 | 2 |
|       |                     | 6               | P1-P2-P3-G1-chest clinic | 4 | 11.33 | 2.5 | 10 | 12 | 1 | 4 | 1 |
|       |                     | 53              | P1-G1-chest clinic | 2 | 18.81 | 2 | 4 | 12 | 11 | 31 | 11 |
|       |                     | 2               | P1-chest clinic | 1 | 13.00 | 5 | 8 | 13 | 1 | 0 | 1 |
|       |                     | 8               | G1-G2-chest clinic | 2 | 27.25 | 3 | 2 | 15.5 | 0 | 8 | 0 |
| 3     |                     | 1               | Others-DOTS-chest clinic | 2 | 28.00 | 21 | 7 | 28 | 0 | 0 | 1 |
|       |                     | 1               | P1-G1-G2-chest clinic | 3 | 40.0 | 1 | 39 | 40 | 0 | 1 | 0 |
|       |                     | 4               | Dispensary-G1-chest clinic | 2 | 54.00 | 5 | 6 | 42 | 0 | 4 | 0 |
|       |                     | 8               | P1-P2-P3-G4-G1-chest clinic | 5 | 104.75 | 44 | 34 | 78 | 1 | 5 | 2 |

**Total** 150

DOTS: Directly observed treatment short course
Although the difference in the two groups (group 3 and group 2) was not significant with respect to the referring agency, it was observed that referral to the chest clinics by government (91; 68.9%) was higher in medium length paths in comparison to longer paths (9; 64.3%).

Referral to chest clinic by self was significantly associated with shorter paths (group 1) in comparison to medium length paths (group 2) ($P = 0.02$).

**Delay in health-care seeking**

Median patient delay was 3.5 weeks (IQR = 2-8). Median referral and diagnostic delay were 3 weeks (IQR = 1-8.2) and 2 weeks (IQR = 1-2). Median health facility delay was 4.5 weeks (2-10) and median total delay was 12 weeks (IQR = 4-16).

Median patient, health facility, and total delay in females (4, 6, and 12 weeks respectively) were significantly higher than those in males (2, 4, and 8 weeks respectively).

**Maximum median total delay** was seen in patients in whom site of EPTB was eye (26.5 weeks) followed by abdomen (16 weeks), lymph node tuberculosis (LNTB), joint TB, skin TB (12 weeks each) and pleural effusion (4 weeks) (Table 3).

Median referral delay was maximum in those patients who were referred to chest clinic by private practitioners’ (5 weeks; IQR = 1-10) followed by self-referred (4 weeks; IQR = 1-9) and government (2 weeks; IQR = 2-7) ($P = 0.059$; median test).

All types of median delays increased with an increase in the number of health facilities availed ($P < 0.05$; median test).

Factors significantly associated with patient delay of more than the median value (3.5 weeks) were younger age ($\leq 30$ years), female gender, residence in a lower socioeconomic area (rural area, resettlement colony, JJ cluster), education only up to primary level, occupation such as laborer, cultivator, student, retired, housewife and the patients’ perception that disease was not serious.

Patients’ delayed health-care seeking was significantly associated with symptoms such as eye redness, skin lesion, and discharging sinus and health-care seeking behavior that included visiting a private health facility first and availing more than four health facilities (Table 4).

Factors significantly associated with health facility delay of more than 4.5 weeks were residing in an urban area, female gender, being occupied as laborer, unemployed, student, housewife, retired, having monthly per capita income of less than or equal to Rs. 500.

Fever, joint pain, and skin lesion were symptoms significantly associated with health facility delay.

Health-care seeking behavior significantly associated with health facility delay were availing more than two health facilities, going to a private health facility first, travelling a distance of more than 100 km to the chest clinic and referral to chest clinic by a private practitioner or self (Table 5).

On binary logistic regression, factors which were significantly associated with patient delay were an education level up to primary, being occupied as laborer, skilled worker, student, retired, housewife, perception that the disease is not serious, and availing five health facilities.

Residence (i.e., urban areas), symptoms of fever, joint pain and skin lesion, availing first health facility as private, availing more than two health facilities and travelling distance of more than 100 km to reach chest clinic were significantly associated with health facility delay of more than 4.5 weeks (Table 6).
DISCUSSION

Studies on health-care seeking pathways and delays in PTB patients are available from many countries including India, China, and Ethiopia.10-11 However, published literature did not show similar studies in EPTB patients.

Patients with EPTB manifest site specific symptoms along with constitutional symptoms.10 In India, LNTB continues to be the most common form of EPTB. Hence, predictably, this was the first symptom responsible for treatment seeking in the majority (70; 46.7%).

Preferred first health-care facility was private (86; 57.4%) chosen for being the nearest one. Similar findings were observed in a survey, in which, 53.4% patients also preferred a private facility over government.12 This implies the importance of sensitizing private practitioners to management of EPTB as has been done more for PTB cases in the program. Patients, who preferred government health facility, did so for nearness, followed by its perceived good quality and low cost. However, other studies show that the government facilities are perceived as low quality.12,13 Further studies are required to see if this is so because people perceived their symptoms as suggestive of a disease requiring long-term treatment and high cost.

In order to link all health-care providers with RNTCP, Government of India approved Non Government Organisations/ Public Private NGO/PP schemes in 2000-2001, which have been updated from time to time. Intensified scale up of public private mix (PPM) has shown improvement in case detection of pulmonary TB and notification rates by providers.14 A similar approach needs to be extended to EPTB management.

In the present study too, the majority were referred to the chest clinic (TB facility) by another government facility (102; 68%) thereby indicating the program’s greater success in the government sector. A study from Mysore, India showed that only less than half of the doctors in the

Table 4: Factors associated with T1 >3.5 weeks*

| Factors                              | T1 ≤3.5 weeks | T1 >3.5 weeks | P value |
|--------------------------------------|---------------|---------------|---------|
| Age                                  |               |               |         |
| ≤30 year                             | 53            | 65            | 0.028   |
| >30 year                             | 22            | 10            |         |
| Gender                               |               |               |         |
| Male                                 | 40            | 28            | 0.07 (two sided) |
| Female                               | 35            | 47            | 0.03 (one-sided) |
| Locality                             |               |               |         |
| Rural, resettlement colony, JJ cluster | 16       | 28            | 0.048   |
| Unauthorized colony, walled city, regular colony | 59   | 47            |         |
| Education                            |               |               |         |
| Primary and below                    | 36            | 49            | 0.03    |
| Above primary                        | 39            | 26            |         |
| Occupation                           |               |               |         |
| Laborer, technical worker, student, retired, housewife, others | 37   | 53            | 0.01    |
| Petty shopkeeper, service, business, unemployed | 38   | 22            |         |
| Seriousness                          |               |               |         |
| Serious                              | 33            | 15            | 0.003   |
| Not serious                          | 42            | 60            |         |
| 1st health facility availed          |               |               |         |
| Government                           | 49            | 37            | 0.04    |
| Private                              | 26            | 38            |         |
| No. of health facilities availed     |               |               |         |
| ≤2                                   | 7            | 1             | 0.03 (one-sided), 0.06 (two-sided) |
| >5                                   | 74           | 68            |         |
| Symptom for which first health facility visited |           |               |         |
| Chest pain, abdominal pain, fever, joint pain, loss of appetite, cough, breathlessness, nodular skin swelling | 75 | 70 | 0.05 |
| Eye redness, skin lesion, discharging sinus | 0 | 5 | |

Table 5: Factors associated with health facility delay (T2T3) >4.5 weeks*

| Factors                              | (T2T3) ≤4.5 weeks | (T2T3) >4.5 weeks | P value |
|--------------------------------------|-------------------|-------------------|---------|
| Locality                             |                   |                   |         |
| Rural                               | 11                | 3                 | 0.02    |
| JJ cluster, resettlement colony, unauthorized colony, walled city, regular colony | 64 | 72 |         |
| Gender                              |                   |                   |         |
| Male                                 | 41                | 27                | 0.03    |
| Female                               | 34                | 48                |         |
| Occupation                           |                   |                   |         |
| Technical worker, petty shopkeeper, service, business | 28 | 17 | 0.05 |
| Laborer, student, unemployed, retired, housewife, others | 47 | 58 |         |
| Per capita income                    |                   |                   |         |
| >Rs. 500 pm                          | 57                | 43                | 0.01    |
| ≤Rs. 500 pm                          | 18                | 32                |         |
| No. of health facilities availed     |                   |                   |         |
| ≤2                                   | 73                | 48                | <0.0001 |
| >2                                   | 2                 | 27                |         |
| 1st health facility visited          |                   |                   |         |
| Government                           | 45                | 19                | <0.00001 |
| Private                              | 30                | 56                |         |
| Symptom for which first health facility visited |           |                   |         |
| Cough, nodular skin swelling, abdominal pain, loss of appetite, chest pain, discharging sinus, breathlessness, eye redness | 59 | 40 | 0.001 |
| Fever, joint pain, skin lesion       | 16                | 35                |         |
| Distance                             |                   |                   |         |
| Median                               | 100               | 200               | 0.01 (Mann-Whitney) |
| Distance ≤100 km                     | 47                | 29                | 0.005   |
| Distance >100 km                     | 28                | 46                |         |
| Referred to chest clinic by          |                   |                   |         |
| Government                           | 57                | 44                | 0.024   |
| Private/self                          | 18                | 31                |         |
Though a delay of only 1.5 weeks was associated with longest paths in comparison shortest paths. These symptoms, being constitutional are not considered in the differential diagnosis of EPTB. This could be due to the fact that duration of symptoms is not considered due to the multiplicity of providers visited.

Referral to chest clinic by self was significantly associated with shortest paths (group 1) in comparison to medium length paths (group 2). This indicates that the general population should be sensitized regarding EPTB so that they seek treatment at the earliest from TB health facilities as has been seen in case of PTB.[16]

Median patient delay was 3.5 weeks (IQR = 2-8) in our study. Median patient delay in EPTB patients reported in other studies are 12.8 weeks (90 days) in Ethiopia, 8.6 weeks in New York, 6 weeks in Norway and 1.6 weeks in Vietnam.[7,17-19]

In our study, patient delay for joint TB and LNTB was 12 weeks each though in Scotland, it was 28 weeks and 26 weeks respectively in Caucasians.[20] Awareness about the possibility of TB in a patient with lymph node swelling or joint pain needs to be raised for seeking early treatment in the general population.

Median health facility delay in our study (4.5 weeks) was similar to the one reported in a study from Vietnam (4.6 weeks).[19] Though a delay of only 1.5 weeks was reported from Ethiopia and 6 weeks from Norway.[7,18]

Maximum health facility delay seen in patients in whom site of EPTB was skin (8 weeks) followed by LNTB, bone/joint TB (6 weeks) and abdominal TB (5.5 weeks). This calls for increasing the involvement of concerned specialists in these fields through training programs.

Median total delay was 12 weeks, which is similar to the finding in Norway (11.5 weeks).[18]

However, in Vietnam median total delay was 6.5 weeks and 26 weeks in Ethiopia.[7,19]

In our study, median total delay was 8 weeks in females which is similar to median total delay in women developing TB during pregnancy.[21]

Although systematic review among PTB patients shows no difference in delay in developing and developed countries, such studies are lacking in EPTB patients.[22]

**IMPLICATIONS FOR THE PROGRAM**

Greater health facility delay was seen when patient sought care from a private health facility first probably because of lower involvement of private practitioners in the TB program, also reflected in the poor referral. This indicates that they are either not suspecting TB in most of the EPTB patients are not aware of the government facilities where TB is treated or are not motivated to refer suspected TB cases to government facilities. In any of these cases, special initiative is required to increase the participation of private sector in the TB program.

Increasing public awareness especially about the various disease presentations can help reduce patient delay. There is a need to have standardized training modules and IEC materials created by experts.

Sensitizing the public specifically on EPTB in addition to PTB, symptoms/disease presentations and availability of drugs under RNTCP free of cost, continuing medical educations for respective specialists and faculty of teaching institutions in addition to programs for private practitioners (PPs) and involvement of PPs will help in lowering the burden of disease and improve the quality of life of those affected

**Limitations of the study**

Health seeking behavior and time delay in treatment seeking was recorded based on memory of the study subjects. Recall bias by study subjects is an important limitation of the study. Self-reporting of smoking, alcohol consumption and dependence on drugs was low. Therefore, their contribution in treatment delays cannot be elicited.

| Factors                                  | P value | OR    | 95% CI        |
|------------------------------------------|---------|-------|---------------|
| Patient delay >3.5 weeks                 |         |       |               |
| Education (up to primary)                | 0.013   | 2.72  | 1.23-6.02     |
| Occupation (laborer, technical worker, student, retired, housewife, others) | 0.007   | 3.13  | 1.37-7.16     |
| No. of health facility 5 and above       | 0.013   | 16.91 | 1.81-157.59   |
| Perceiving symptoms to be not serious    | 0.005   | 3.32  | 1.43-7.71     |
| Health facility delay >4.5 weeks         |         |       |               |
| Locality other than rural                | 0.011   | 11.16 | 1.75-71.24    |
| 1st health facility private              | 0.038   | 2.53  | 1.05-6.06     |
| No. of health facilities availed >2      | 0.002   | 15.23 | 2.81-82.43    |
| Distance >100                            | 0.031   | 2.55  | 1.09-5.97     |
| Symptom (fever, joint pain and skin lesion) | 0.03   | 2.57  | 1.09-6.04     |

*Factors such as smoking, alcohol, and drug addiction have not been considered in analysis of treatment pathways as the self-reporting of these habits was by 13 (8.7%), 8 (5.3%), and 1 (0.7%) subjects respectively. CI: Confidence interval, OR: Odds ratio

The fact that 30 patients (20%) had come to the chest clinic on their own is an indirect indicator of the awareness generation done in Delhi. Poor referral by private practitioners (18%) is a matter of grave concern as they are the first health-care providers for the majority.

Symptoms such as fever, abdominal pain and joint pain, which are not specific to EPTB, were significantly associated with longest paths in comparison shortest paths. These symptoms, being constitutional are not considered in analysis of treatment pathways due to the self-reporting of these habits was by 13 (8.7%), 8 (5.3%), and 1 (0.7%) subjects respectively. CI: Confidence interval, OR: Odds ratio

Factors such as smoking, alcohol, and drug addiction have not been considered in analysis of treatment pathways as the self-reporting of these habits was by 13 (8.7%), 8 (5.3%), and 1 (0.7%) subjects respectively. CI: Confidence interval, OR: Odds ratio

**Table 6: Predictors of patient delay and health facility delay of more than the median value**
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