Original Article

Cost of DOTS for Tuberculous Patients

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Abstract

Objective: To determine the cost of DOTS (directly observed therapy short course) incurred by the patients.

Methods: A hospital based cross-sectional study was conducted at Nazimabad Chest Clinic and Ojha Center for Chest Diseases from January 2005 to July 2005. Two hundred and twenty tuberculous patients with acid-fast bacilli positive in their sputum were analyzed. Variables for cost were assessed with respect to money and time.

Results: Most of the tuberculous patients (68%) registered during the data collection period were females. Thirty seven percent of the patients belonged to families with 8-10 family members living under one roof. The expense of direct cost for two months treatment was Rs. 3060-3600 (if patient was not buying the anti-tuberculous drugs). Most of the patients who were on DOTS spent more than 4 hours per day in obtaining the therapy. The disease was found to be common in poor families (75% of patients had total monthly income less than Rs. 2000).

Conclusion: Tuberculosis was common in poor and large-sized families. Time consumption on travel for DOTS was a deterrent for compliance. DOTS coverage should be modified to reduce time and financial cost for the patients (JPMA:56:207;2006).

Introduction

Tuberculosis is a disease that has a major impact on a global scale.[1] Tuberculosis causes death of nearly 3 million people every year.[2] Tuberculosis eradication has become a matter of greater concern among the national, international and local health authorities. Contributing 85% to the total global burden, 22 countries have been identified and labeled as highly endemic countries by W.H.O.[3] Due to the emergence of H.I.V., increased migration and the deterioration of the health services in many countries, the incidence has risen so drastically in recent years, that T.B. was declared a global emergency by W.H.O. in 1993.[4] Without increased investment in intervention strategies, the global tuberculosis situation is expected to worsen in the near future.[5]

There is little reliable epidemiological data available for Pakistan, although TB is considered to be a major cause of ill health.[6] According to World Health Organization (W.H.O.) report of the year 2000, Pakistan stands at number " 6" behind China,

India, Bangladesh and Indonesia in the list of 22 highest burden TB countries of the world.[7]. There are estimated 268,000 new cases and 64,000 deaths from TB each year in Pakistan; which bears 44% burden of TB cases in the W.H.O. Eastern Mediterranean Region (E.M.R.O.).[8] The annual incidence of infectious T.B. cases is estimated to be between 85-100 / 100,000 persons. Annually around 120,000 new TB cases are being added to the existing number of infectious individuals. Based on burden of disease estimates, TB represents 5% of the total DALYs (disability adjusted life years); which indicates that the burden of tuberculosis in Pakistan, is substantially higher than the world's average of 3%.[9]

Tuberculosis is especially prevalent in the population undergoing stresses of poor nutrition, overcrowding, inadequate health and displacement.[10] Government of Pakistan endorsed DOTS strategy and in 1994, in collaboration with W.H.O., revised the TB control policy and technical guidelines.[11]

In DOTS patient swallows the medicines under the watchful eye of the doctor, a health worker, community volunteer, mohalla molvi, pharmacist, or even any entrusted family member.[12] The TB patient is almost always cured if these medicines are taken regularly for the entire period of time. The anti-tuberculous drugs in this short-course chemotherapy are Isoniazid, Rifampicin, Pyrazinamide and Ethambutol or Streptomycin.

DOTS stops TB bacteria at the source. Curing a contagious patient is the best way to prevent TB bacteria from spreading to others.[13]

In Pakistan low treatment adherence prevails.[14] In the sixties Sloan and Sloan observed dropout rates of 66% in Sindh[15], similar reports were found in the recent Rawalpindi cohort study.[16] Several studies have shown financial factors contributing to non-adherence to treatment. Research has shown irregularity of attendance during the initial phase to be a major determinant for treatment adherence not only in the initial phase but also in the continuation phase.[17] This study was conducted at Karachi Medical and Dental College on tuberculous patients to identify the barriers in the implementation of DOTS.

The other objective of the study was to determine the cost on DOTS incurred by the patients and the factors responsible for non-compliance.

Patients and Methods

A cross-sectional study was conducted at Iqbal Yad Chest Clinic (O.P.D.) of Ojha Center and Nazimabad Chest Clinic. A sample of 220 was estimated assuring compliance of 50% with a level of significance of 5%. All the consenting patients attending the TB O.P.D. between 9:00 a.m. till 1:30 p.m. were registered between January and June 2005. Non-probability convenience sampling technique was used.

A questionnaire was prepared keeping in mind the information needed regarding DOTS with respect to money and time. The variables for money were in terms of direct cost spent in traveling and buying the O.P.D. slip. The cost on buying anti-tuberculous drugs was not included as those were given free at the centers. Indirect cost on DOTS was the time spent in traveling and waiting in O.P.D. Cause of previous incomplete treatment was also asked from the re-treatment cases.

The questionnaire consisted of twenty close-ended questions. For each question a code was assigned and data was collected by face-to-face interaction through verbal communication. Sputum was tested for acid-fast bacilli. Pre-testing was carried out three days before the actual study in O.P.D.

Results

Most of the patients registered in the TB center (82%)(180/220) were the new cases. Nine percent were relapses and 9% were defaulters (Figure 1). Sixty eight percent (150/220) patients registered in the T.B. O.P.D. were females, among them 40% (87/220) were in the age group of 11 to 20 years and 21% of the males (45/220) were in the age group of 31 to 40 years (Table 1).

Thirty seven percent (81/220) of the T.B. patients belonged to those families where total family members were between 8 to 10 living under one roof. Sixty one percent (135/220) patients spent

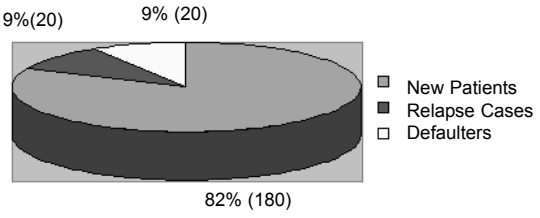

Figure : Distribution of the categories of the TB patients

Table 1. Association of sex with the age of the TB patients.

Age in years	Male No.	Patient %	Female No.	Patient %	Total No.	Total %	p-value
11-20	3	1	87	40	90	41	
21-30	15	7	30	13	45	20	
31-40	45	21	15	6	60	27	0.000
41-50	3	1	15	6	20	9	
> 50	4	2	3	1	5	3	
Total	70	32	150	68	220	100	

Rupees 41 to 60 on traveling. The mean daily expense was Rupees 42 and for two months intensive therapy it was Rs.2520. Forty four percent (96/220) patients stated that more than 4 hours were spent (including traveling both ways and waiting in the O.P.D.) on DOTS practice, mean time spent was 3 hours and 15 minutes.

Table 2 shows the causes of previous incomplete treatment compared with the total monthly income of the T.B. patients. Eleven percent (25/220) of the patients were those who stopped treatment as it was expensive. Seventy five percent (167/220) of the patients belonged to the families where total monthly income was less than Rs. 2000. The relationship between the total monthly income and the causes of previous incomplete treatment was statistically significant (p=0.001).

The distance in kilometers traveled by the patients compared with the categories of the patients, revealed that 57% (124/220) patients came from a distance more than 15 kilometers and among them most were new cases i.e., 43% (95/220) The relationship between the categories of the T.B. patients with the distance was statistically significant (p= 0.0038).

Discussion

Various studies in U.K. have established over-crowding and socioeconomic deprivation as major factors for the rise in tuberculous cases.[18] A study in Lahore, Pakistan showed that majority (71%) of the tuberculous patients were members of the poor, deprived and lower social class [19]. In our study also majority of the patients were from lower socioeconomic group (monthly income less than Rs.2000) and having large families. Overcrowding in small enclosed spaces with close and prolonged contact with other family members provides an opportunity of infection to spread from one individual to the other through droplets or coughing.[20] Most of the patients spent Rupees 51- 60 daily and for two months intensive therapy amounts to Rs. 3060-3600,

Table 2. Relationship of reasons for previous incomplete treatment with the total monthly income of the patients.

CAUSES N=220	INCOME IN RUPEES								p-value
	<2000 n=170		2000-4000 n=31		4000-6000 n=10		>6000 n=9		
	No.	%	No.	%	No.	%	No.	%	
1. Expensive medicine n=5	2	40	1	20	1	20	1	20	0.0001
2. Prolonged treatment not necessary n=5	1	20	2	40	1	20	1	20	0.001
3. Long distance n=30	20	67	5	17	3	10	2	6	0.006
4. No cause as new cases n=180	147	82	23	12	5	3	5	3	0.0003

** Expensive drugs was the cause of discontinuation of treatment when tuberculosis was first diagnosed.

which the poor patients could not afford. With poverty also comes malnutrition leading to weakening of body defences. With the expense of treatment and the lengthy therapy involved for tuberculosis, majority of the patients could not afford to buy medicines and bear traveling expenses when their basic needs are not being met. Most of the male patients in our study group were found to be in the age group when their families were dependent on them for earning and providing financial support. This would simply perpetuate the vicious cycle of poverty leading to lower defences. Females from illiterate families in general have a lower status in the family, and are deprived of better quality of food leading to poor nutritional status. In addition early marriages and multiple pregnancies put extra burden on their defence system leaving them more vulnerable to tuberculosis.

From our study it appears unlikely that medical advances alone can control tuberculosis. As the powerful tools for treatment and prevention which are currently available have made little impact, so any new methods would have little impact unless there is global political willingness to address gross inequalities of wealth and health care provision in society.[21]

While tuberculosis can affect anyone, the greater burden of disease falls on the poor.[22] The director of W.H.O. Global TB Program has stated, "epidemic is no longer an emergency only for those who care about health, but for those who care about justice".[23]

Conclusions

Tuberculosis continues to affect the poor deprived communities and despite increased coverage of DOTS the disease continues to increase in younger females and males in their prime productive ages. DOTS coverage should reach TB patients at home as time and travel cost are major deterrents to compliance.

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Introduction