

Original Research Article

Analysis of drug resistant cases of pulmonary tuberculosis with special reference to causes

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ABSTRACT

Background: Despite advancement of newer diagnostic tools and medicine Drug resistant tuberculosis (DRTB) is a challenge which cannot be eliminated without public participation. This study was designed to know etiology of the drug resistant pulmonary tuberculosis cases.

Methods: Prospective observational study was undertaken among adult patients in a tertiary care hospital 50 patients were studied and analyzed, all patients who were drug resistant either mono or poly from Revised national tuberculosis control programme (RNTCP) accredited lab were included in the study. Factors leading to resistance were analyzed.

Results: Of the 50 patients included in this study majority were male 72%, 68% rural population, 34% were daily wage worker and 14% were farmer. 78% patients of study group had income <50,000 per annum or dependent to others, associated comorbidities were alcoholic cirrhosis (18%), diabetes mellitus (16%), pyothorax (16%) and hepatic disorder (12%). Cause of default included side effect 26%, longer duration 34%, feeling well (26%), social stigma (12%), financial problem in (20%), poor supply of anti-tubercular drugs (8%) and negative attitude of drug provider (6%).

Conclusions: Poor education lead to less awareness about tuberculosis its diagnosis and adequate treatment, financial crisis leads to early termination in non-Dots. Drug default was most important factor for drug resistance. RNTCP provides free medication by DOTS leading to less default and early diagnosis of DRTB.

Keywords: Drug resistant pulmonary tuberculosis, Default, DOTS, RNTCP

INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by Mycobacterium tuberculosis. The disease mostly affects lungs and causes Pulmonary TB (PTB). TB has coevolved with humans for many thousands of years, and perhaps for several million years.¹ Factor contributing to development of Drug resistant tuberculosis (DRTB) includes clinical factors unreliable treatment regimens, inadequate dosage, addition of single drug to a failing regimen, availability of anti-TB drug over the counters, delay in diagnosis, biological factor includes genetic predisposition, large

bacillary population, cavitory lesion, local factors in host.² Social factors includes: irregular or inadequate intake of drugs, ignorance, poverty. So, there may be multiple factors responsible for development of chronic cases of pulmonary tuberculosis. So, we planned a study to find out the factors which lead to multi-drug resistant (MDR) tuberculosis in Hadoti region.

The Revised national tuberculosis control programme (RNTCP) District Task Force (DTF) and DOTS implementation in Kota district was started in Government Medical College, Kota covers 3 different district (Baran,

Bundi and Jhalawar) excluding Kota. This study was undertaken to understand and assess risk factors for DRTB patients in patients treated in both private as well as government sector. This will help to prevent the risk of further disease transmission and resistance to drugs. This information would be utilized to suggest methods to improve case detection and treatment of PTB patients under the programme.

METHODS

This prospective observational study was carried out in a tertiary care hospital from January 2017 to January 2018. Patients who got admitted in Tuberculosis ward during this period who DRTB patients. Clinical profile and factors leading to chronicity were analyzed Total 50 patients enrolled in study. Criteria of inclusion included microbiologically confirmed mono or polydrug resistant cases from RNTCP accredited health lab. Criteria of exclusion included: patients of extra pulmonary tuberculosis, mono or polydrug resistant cases from non RNTCP accredited health lab and patients who did not give consent.

Detailed history in form of questionnaire and clinical examination were performed on each patient. Laboratory investigations done were sputum Acid fast bacilli (AFB), Cartridge based nucleic acid amplification test (CBNAAT), Line probe assay (LPA), chest radiograph. Detail questionnaire including epidemiological profile and questionnaire Informed consent was obtained from each patient.

RESULTS

Among 50 study patients 36 (72%) were male and 14 (28%) were female majority of patients were in the 26-45 years age group, which is known to be the most economically productive period of life, most of the patients 34 (68%) were residing in the rural area (Table 1).

Table 1: Demographic variables of the patients.

Demographic variables	Number of patients
Gender	
Male	36
Female	14
Age	
16 to 25	8
26 to 35	17
36 to 45	13
46 to 55	6
56 to 65	6
Residence	
Rural	34
urban	16
Marital status	
Married	43
BMI	
Below normal (<18.5)	41
Normal	9

Table 2: Epidemiological and clinical characteristics of a cohort of 50 tuberculosis patients (n=50).

Characteristics	Number
Educational status	
Illiterate	17
Literate	5
Primary	14
Middle	4
Secondary	3
Senior secondary	3
Graduate	3
Post-graduate	1
Income (in Rupees)	
Dependent to other	17
≤50,000	22
50,000-100,000	7
100,000-200,000	2
>200,000	2
Occupation	
Daily wage worker	17
Farmer	7
House lady	11
Government servant	3
Private job	6
Unemployed/students	6
History of TB treatment	
RNTCP	26
Private	4
Initial private than RNTCP	3
Initial RNTCP than private	17
Smoking habit	Male/female
Smoker	22/1
Non-smoker	14/13
Veg./ Non-vegetarian	
Vegetarian	30
Non-vegetarian	20
History of contact with	
TB patient	13
MDR patient	6
X ray changes	MDR/mono DR
Cavitatory	12/11
Non-cavitatory	3/3
Comorbidity	
Diabetes mellitus	8
Alcoholic cirrhosis	9
Hepatic disorder	6
Pyothorax	8
Cause of default	
Took treatment less seriously	18
Drug regime too long	17
Financial problem	13
Side effect of drugs	13
Symptomatic relief	9
Social stigma	6
Poor supply of drugs	4
Negative attitude of drug provider	3

Most of the patients (72%) were educated up to or below primary level. Majority of patients (78%) had income <50,000 per annum or dependent to others. 17 were daily wage worker and 7 were farmer. Last treatment 52% had Directly observed therapy (DOTS) treatment under RNTCP followed by 40% patients had both type of treatment i.e. DOTS under RNTCP and non-DOTS under private. 61.11% were smoker and majority of female patients (92.86%) were non-smokers. 26% patients had contact history with known TB patient while 12% patients had contact with MDR TB patient. Comorbidities included alcoholic cirrhosis (18%), diabetes mellitus (16%), pyothorax (16%) and hepatic disorder (12%). Causes of default included 18 (36%) not regular treatment, long duration of treatment 17 (34%), financial crisis 26%, adverse reaction of drugs 26%, 18% patients not complete their treatment due to symptomatic relief. Social stigma (12%) 8% non-availability or irregular supply of Anti-tubercular treatment (ATT) drugs. (6%) negative attitude of health worker, they were reluctant to continue regular treatment. (Table 2)

DISCUSSION

The present study was carried out to know the factors that led to the development of chronic tuberculosis in patients of Hadoti region. Out of 50 study patients 36 (72%) were male and 14 (28%) were female. Male being a predominant earning member had an adverse impact on the socio-economic status of the family. In study by Goyal et al on drug default among 262 PTB patients, found that 73.4% patients were males.³

In present study 60% of study patients were in the age group of 26 to 45 years, which is known to be the most economically productive period of life. Kotokey et al found the median age of study population 35 years.⁴

Our maximum patients 68% were from rural areas, whereas 32% from urban area majority belonging to low socioeconomic status. Kotokey found (66.1%) from rural (32.9%) patients from urban area.⁴

34% of study population was illiterate and 38% of patients were educated below primary level. Only 38% of patients were educated more than primary level. Similarly, Kotokey et al observed maximum (42.4%) patients were illiterate. 18.6% of patients each had primary and middle school level of education respectively.⁴ Similar observation also found by Meriki et al and Cherkaoui et al.^{5,6}

In our study most patients (78%) had income <50000 rupees per annum or dependent to others. Lower incomes are considered to be greater risk for defaulter/MDR and thus chronic tuberculosis. Djibuti et al concluded lower household income were at greater risk of poor TB outcome.⁷ Gaude et al also found low socioeconomic status was a significant factor for the development of DRTB.⁸

In present study majority of patients (82%) were below normal body mass index. Malnutrition or thin built people are more likely to fail on treatment. Tsuchiya et al also reported that among chronic excretor, 55.8% patients had low body mass index (BMI).⁹ Also, Kotokey et al observed that average current body weight of patients was 37 kg (maximum 50 kg and minimum 25 kg).⁴ The average BMI was 15.2.

In present study 62% patients did not had history of contact while 38% had history of contact with tubercular patient including patients with MDR TB. Wahab et al observed that 23.3% patients had family history of TB but none had documented MDR TB in the family.¹⁰ Meriki et al concluded that previous household contact with TB patient were independently associated with tubercular prevalence, while only previous TB infection was associated with drug resistance.⁵

On radiological evaluation of our study population majority of chronic tubercular patients 66% patients had cavitory lesion on X-ray chest. Similarly, Yagi T et al also observed that 88.4% patients of their study population had cavitory lesion on X-ray chest.¹¹

In present study among DR TB patients associated comorbidities included alcoholism (18%), diabetes mellitus (16%), pyothorax (16%) and hepatic dysfunction (12%) also played a significant role in developing cases of chronic tuberculosis. Similar observation found by Kotokey et al who observed that among defaulters of pulmonary tuberculosis 8% had co-existing diabetes mellitus, 5.08% had chronic liver disease.⁴ Thus we assume that the cause of DRTB in our study population is probably due to default (60%), associated co-morbidity (54%), drug resistance (58%) either mono or multi drugs. Cherkaoui et al observed that according to the patient survey, most commonly chosen reasons for default were resolution of symptoms (32%), side effects (14%) or "other" (32%). In open-ended questions, 17% said the reason for default was multifactorial, while 21% cited personal or family problems.⁶

CONCLUSION

From the present study we conclude low education status lead to decreased awareness about tuberculosis, its diagnosis and adequate treatment, poverty leads to early interruption which lead to development of DRTB. Cause of default included long duration of treatment social stigma, poor drug supply We would like to recommend to RNTCP for freely available diagnosis and treatment, by treating adequately without default and decreasing the chances of drug resistance we can decrease the incidence of DRTB.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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