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Epidemiological and clinical profile of multi drug resistant tuberculosis cases in Chitradurga district

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ABSTRACT

Background : The drug resistant tuberculosis has emerged as an important public health problem. Some epidemiological factors are known to influence the emergence multi drug resistant tuberculosis. This study was undertaken to study the epidemiological factors and clinical factors in emergence of multi drug resistant tuberculosis.

Material and Methods : A cases control study was undertaken in the department of Chest and tuberculosis of a tertiary care hospital. A total of 30 cases confirmed as Multidrug resistant tuberculosis patients constituted the cases. About 60 age and sex matched controls were taken in to the study. A detailed history was taken with the help of a standardised proforma for both cases and controls.

Results : Most of the multidrug resistant tuberculosis cases belonged to earning age group and males outnumbered females. Cough was the common symptom in cases followed by shortness of breath, expectoration, fever, haemoptysis, chest pain and wheezing. Controls had symptoms in lesser extent than cases in this study. The diabetes mellitus and HIV were the common comorbidities among the cases. About 50% of the cases were former smokers and 40% were alcoholics and 16.7% were tobacco chewers in this study. The treatment was regular in 30% and missed doses were more than 40 in 46.3% of the cases. About 60% of the cases were compliant with the drugs.

Conclusions: This study had shown that, epidemiological factors play key role in emergence of multi drug resistant tuberculosis and early screening can help in prevention of emergence of multi drug resistant tuberculosis.

1. Introduction

Tuberculosis continues to be an important health problem especially in developing countries like India. The emergence of drug resistant tuberculosis is posing a major threat in the control of Tuberculosis. The estimated multi drug resistant and Rifampicin – resistant tuberculosis cases around the world was 4,84,000 worldwide. India had estimated multi drug resistant tuberculosis / Rifampicin resistant - tuberculosis cases of 1,30,000[1]. The factors including inadequate chemotherapy, poor adherence to treatment, treatment failure, prior treatment, pulmonary cavity tuberculosis, diabetes and Human immunodeficiency virus infection are known to progress the drug adherence[2,3].

The available study shows that, the epidemiological characteristics and clinical profiles of the patients with the multidrug resistant tuberculosis varies from one region to another region. The knowledge of these characteristic are essential to develop the treatment strategies and can help the government to establish the policies[4,5] . Hence this study was taken up to assess the clinical and epidemiological characteristics of patients with multidrug resistant tuberculosis.

2. Material and Methods

A case control study was conducted in the Chest and TB outpatient department of Basaveshwara Medical College and Hospital, Chitradurga in order to study the

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epidemiological characteristics and clinical characteristics of Multi drug resistant tuberculosis cases. A total of 30 cases confirmed as Multidrug resistant tuberculosis patients constituted the cases. For the purpose of the study, MDR TB was defined as "A multi-drug resistant tuberculosis suspect who is sputum culture positive and whose TB is due to Mycobacterium tuberculosis that are resistant in-vitro to at least isoniazid and rifampicin (the culture and DST result being from an RNTCP accredited laboratory)". The patients with non-drug resistant tuberculosis constituted the control group. About 60 age and sex matched controls were taken in to the study. The cases and controls satisfying the cases definition and started with multi drug resistant tuberculosis treatment regimen as per drug-susceptibility test results were included in to the study. The patients who refused to give consent were excluded from the study.

A total of 30 cases and 60 controls were examined thoroughly for the epidemiological and clinical characteristics. A detailed history including details of cough, expectoration, history of ATT & follow up at period intervals was taken. A standardized proforma was administered for both cases and controls. The data thus obtained was compiled and analyzed using Statistical Package for Social Services (SPSS vs 20) using appropriate statistical tests.

3. Results

This study had shown that, about 53.3% of the study subjects belonged to 21 – 30 years. Males outnumbered females. About 50% of the study subjects belonged to rural areas. Majority of cases were educated up to primary school and 41.7% of the controls were educated up to secondary school. Majority of the cases and controls were Hindu by religion and nuclear family and married. Most of cases were farmers and housewives and majority of the controls were housewives.

Cough was present in 53.3% of the cases followed by shortness of breath (23.3%), expectoration (23.3%), fever (20.0%), haemoptysis (20%), chest pain (20.0%) and wheezing (16.7%). Controls had symptoms in lesser extent than cases.

The haemoptysis was less than 100 ml in 6.7% of the cases, 100 – 200 ml in 6.7% of the cases and more than 200 ml in 6.7% of the cases. The controls had less than 100 ml of the haemoptysis in 3.3% of the cases and 100 – 200 ml in 1.7% of the cases.

The diabetes mellitus was present as co morbidity in 23.3% of the cases and 20% of the controls, kidney disease in 13.3% of the cases and 18.3% of the controls, previous surgery in 10%, steroid intake in 1.7% of the controls. HIV was present in 33.3% of the cases and 6.7% of the controls.

About 50% of the cases were former smokers and 40% were alcoholics and 16.7% were tobacco chewers. Among controls, 20% were former smokers, 35.0% were alcoholics and tobacco chewers.

The treatment was regular in 30% of the cases and 71.7% of the controls. The missed doses were more than 40 in 46.3% of the cases. About 60% of the cases were compliant with the drugs.

4. Discussion

This study was mainly undertaken to assess the epidemiological and clinical factors associated with multidrug resistant tuberculosis. Most of the victims of the multidrug resistant tuberculosis belonged to earning age group and males outnumbered females. Most of the cases were from rural areas and were with low education. Hindus and married people were common in occurrence of multiple drug resistant tuberculosis. The results of this study with respect to age were similar to the studies conducted by Mendes et al.,[6], Coelho et al.,[7] and Micheletti et al.,[8].

Cough was the common symptom in cases followed by shortness of breath, expectoration, fever, haemoptysis, chest pain and wheezing. Controls had symptoms in lesser extent than cases in this study. In a study by Kim et al., he had observed the severe clinical condition was found in 44% of the multi-drug resistant tuberculosis cases. About 34% of the cases had haemoptysis. The haemoptysis was less than 100 ml in 6.7% of the cases, 100 – 200 ml in 6.7% of the cases and more than 200 ml in 6.7% of the cases. Majority of the cases had grade 4 or 5 breathlessness and had high grade intermittent fever compared to controls[8].

The diabetes mellitus and HIV were the common co-morbidities among the cases. In a study, Kim et al had observed that diabetes mellitus was the co-morbidity in 18.7% and 17.1% of the extensively drug resistant tuberculosis and multi drug resistant tuberculosis patients respectively. None of the patients with HIV had extensively drug resistant tuberculosis or multi drug resistant tuberculosis[8].

About 50% of the cases were former smokers and 40% were alcoholics and 16.7% were tobacco chewers in this study. A study by Balaji et al., had shown that the multi-drug resistant TB had a negative association with MDR–TB[9].In a study, Marahatta had observed that smoking is associated with the Isoniazid resistance[10]. In a study in Delhi, smoking was associated factor with 40.8%, 37.7% & 50% of the multi-drug resistant tuberculosis, Pre xtensively drug resistant tuberculosis & extensively drug resistant tuberculosis respectively[11].

The treatment was regular in 30% and missed doses were more than 40 in 46.3% of the cases. About 60% of the cases were compliant with the drugs. Noncompliance favors development of further resistance to other drugs. Poor compliance to drugs is an important risk factor for development of acquired drug resistance in Tuberculosis Patients[11].

Table 1: Distribution of the study group according to epidemiologic characteristics

Epidemiologic characteristics		Cases N (%)	Controls N (%)
Age group	Less than 20 years	1 (3.3)	2 (3.3)
	21 – 30 years	16 (53.3)	32 (53.3)
	31 – 40 years	9 (30.0)	18 (30.0)
	41 – 50 years	3 (10.0)	6 (10.0)
	51 – 60 years	1 (3.3)	2 (3.3)
Sex	Male	16 (53.3)	32 (53.3)
	Female	14 (46.7)	28 (46.7)
Residence	Rural	15 (50.0)	29 (48.3)
	Urban	15 (50.0)	31 (51.7)
Education	Illiterate	5 (16.7)	7 (11.7)
	Primary	15 (50.0)	24 (40.0)
	Secondary	9 (30.0)	25 (41.7)
	Higher secondary	1 (3.3)	4 (6.7)
Religion	Hindu	22 (73.3)	36 (60.0)
	Muslim	6 (20.0)	20 (33.3)
	Others	2 (6.7)	4 (6.7)
Type of family	Nuclear family	15 (50.0)	39 (65.0)
	Joint family	12 (40.0)	20 (33.3)
	Three generation	3 (10.0)	1 (1.7)
Marital status	Married	18 (60.0)	34 (56.7)
	Unmarried	10 (33.3)	22 (36.7)
	Widow / Widower	2 (6.7)	4 (6.7)
Occupation	Daily labourer	3 (10.0)	10 (16.7)
	Farmer	10 (33.3)	11 (18.3)
	Housewife	10 (33.3)	16 (26.7)
	Merchant	2 (6.7)	3 (5.0)
	Skilled labourer	0	5 (8.3)
	Student	3 (10.0)	10 (16.7)
	Unemployed	2 (6.7)	4 (8.3)

Table 2: Distribution of the study group according to symptoms

Symptoms	Cases N (%)	Controls N (%)	χ^2 value	P value, Sig
Cough	16 (53.3)	11 (18.3)	11.667	0.001, Sig
Shortness of breath	7 (23.3)	3 (5.0)	6.806	0.009, Sig
Expectoration	7 (23.3)	2 (3.3)	8.889	0.003, Sig
Fever	6 (20.0)	3 (23.3)	5.0	0.025, Sig
Haemoptysis	6 (20.0)	3 (5.0)	5.0	0.025,Sig
Chest pain	6 (20.0)	4 (6.7)	3.6	0.058, NS
Wheezing	5 (16.7)	2 (3.3)	4.957	0.026, Sig

Table 3: Distribution of study group according to quantity of haemoptysis

Quantity of hemoptysis	Cases N (%)	Controls N (%)
Absent	24 (80.0)	57 (95.0)
Less than 100 ml	2 (6.7)	2 (3.3)
100 – 200 ml	2 (6.7)	1 (1.7)
More than 200 ml	2 (6.7)	0

Table 4: Distribution of study group according to comorbidities

Comorbidities	Cases N (%)	Controls N (%)
Absent	17 (56.7)	31 (51.7)
Diabetes Mellitus	7 (23.3)	12 (20.0)
Kidney disease	4 (13.3)	11 (18.3)
Previous surgery	2 (6.7)	6 (10.0)
Steroid intake	1 (3.3)	1 (1.7)
HIV	10 (33.3)	4 (6.7)

Table 5: Distribution of study group according to habits

Habits	Cases N (%)	Controls N (%)
Never smoker	9 (30.0)	14 (23.3)
Former smoker	15 (50.0)	32 (20.0)
Current smoker	6 (20.0)	14 (23.3)
Alcoholic	12 (40.0)	21 (35.0)
Tobacco chewer	5 (16.7)	9 (15.0)

Table 6: Treatment aspects of MDR TB

Treatment aspects		Cases N (%)	Controls N (%)
Intake of TB drugs	Irregular	21 (70.0)	17 (28.3)
	Regular	9 (30.0)	43 (71.7)
Missed doses	Not missed	5 (16.7)	14 (23.3)
	< or =40	11 (36.7)	22 (36.7)
	41 – 70 doses	9 (30.0)	14 (23.3)
	71 – 100 doses	4 (13.3)	8 (13.3)
	> 100 doses	1 (3.3)	2 (3.3)
Compliance	Compliant	18 (60.0)	41 (68.3)
	Non compliant	12 (40.0)	19 (31.7)

5. Conclusions

This study had shown that, the epidemiological factors play an important role in emergence of multiple drug resistant tuberculosis and early recognition of clinical features can help in initiation of treatment and cure of multi drug resistant tuberculosis at earliest point of time.

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None.

8. Conflict of Interest

None.

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