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ORIGINAL ARTICLE

Occupation and Treatment Outcome of Multi-drug resistant tuberculosis Patients

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ABSTRACT

Background: Tuberculosis is a contagion from ancient times comprising around one 3rd of global population on the wedge of infection with *Mycobacterium tuberculosis complex* where under developed and developing countries is coping with high burden of the disease.
Aim: To observe the most prevalent occupation and treatment outcome in both Genders of MDR TB patients.
Methodology: Health Research Institute-National Institute of Health TB Research Centre in collaboration with Department of Pulmonology, King Edward Medical University/Mayo Hospital Lahore from january 2014 to December 2020. A pre-designed questionnaire was used to collect data from MDR Tb patients after verbal informed consent. Patients were followed to see the final outcome on completion of anti-tubercle treatment. Data was entered and analyzed by using SPSS.
Results: Out of total 450 MDR TB patients analyzed in this study a higher proportion of 54.9% were males and 45.1% were females with an overall mean age of patients as 39.64±17.52 years. Most of 159(35.4%) patients had no skills and were labors whereas most of 145 (28.2%) females were house wives. Almost 71% of the patients successfully completed the treatment including 45% cured on the basis of availability of final smear and culture reports..
Conclusion: A high mortality rate of MDR TB patients was observed while most of the TB patients in this study belong to labor class while most of the women were housewives.
Keywords: Tuberculosis, MDR TB, Occupation, Treatment outcome, loss to follow up.

INTRODUCTION

Tuberculosis (TB) is one of the major contagion from ancient times and remain culprit in mortality and morbidity. Around one 3rd of global population is infected with *Mycobacterium tuberculosis complex* (MTBC) while under developed and developing countries are coping with high prevalence and incidence of the disease.[1] Main hurdle in control of TB is its easy person to person spread through air born droplets. According to World Health Organization (WHO) annual count of around 10 million active TB patients is stable from last few years. Incidence of TB on the other hand varies from region to region and country to country that accounts a broad range of 5-500 infections per 100000 population. Pakistan ranks 4th regarding high burden of TB patients with a high incidence rate of 265 infections per 100000 population[2].

Normally TB is treated with first line anti TB drugs including isoniazid, rifampicin, ethambutol, pyrazinamide and streptomycin but resistance to one or more of these drugs creates serious outcomes. Any TB isolate resistant to isoniazid and rifampicin simultaneously with or without resistant to other first line drugs is called multi drug resistant (MDR)[3]. Drug resistance and MDR TB is posing a notable threat to the global health and found to be associated with different factors including non-adherence or default from treatment, low quality or low doses of drugs, programmatic deficiencies and social stigma among patieints[4]. Some other factors reported variously include addiction like smoking and alcoholism and TB or MDR TB contact history are also well evaluated in literature[5]. Around 484000 new drug resistant TB cases were reported globally during 2018 and Pakistan comprised of 28000 cases[2].

Drug resistant TB requires a longer duration of treatment with potentially toxic second line of drug regime thus limits the choice of effective first line treatment options. An increase in drug resistant TB strains on the other hand shows various degrees of negligence and paucities at programmatic as well as personal level. This situation mediates challenges for physicians to diagnose resistant TB lacking infrastructure and skilled manpower[6]. Although GeneXpert has attributed to overcome the situation by providing rapid diagnosis of rifampicin susceptibility but co-existence of resistance to other four first line drugs could not be ruled out by this and patients are considered and treated as MDR TB patients.[4] Hence there is considerable difference in costs and duration of treating MDR TB patients as compared to normal TB[7].

Identification of the population at higher risk of MDR TB is necessary to find the appropriate strategies for case management. Various attributing factors in development of MDR TB have been greatly studied including poor treatment compliance, comorbidities, gender and younger age, history of smoking, residing in overcrowded places, substance abuse, prisoners and being healthcare professionals[8]. Systematic approach to find the features of MDR TB patients though lacks information whereas all findings could not be generalized without deep evidenced base knowledge.

Purpose of this study is to observe the most prevalent occupation and treatment outcome in both Genders of MDR TB patients.

METHODOLOGY

This descriptive case series study was undertaken in Health Research Institute-National Institute of Health TB Research Centre, Department of Pulmonology, King Edward Medical University Lahore from January 2014 to December 2020 after permission from IRB. Convenient sampling technique was used to collect the data using a pre-designed questionnaire. After taking informed consent, all the patients starting their treatment from programmed management of drug resistant TB site and willing to participate in this study. On the basis of census a total of 450 patients fulfilling the required criterion were included in this study.

A demographic including name, age, gender etc. along histories, presenting complaints and co-morbidities were noted at the time of registration. Patients were followed during treatment to observe the treatment compliance. Further stratification of occupation in regard to occurrence of MDR TB was also noted. Treatment outcome was evaluated at the end of treatment during 18-24 months from date of starting.

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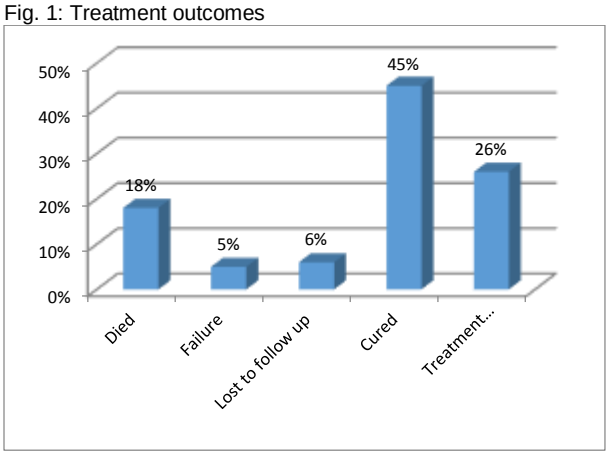
Data was entered and analyzed by using SPSS. Qualitative variables like gender, history of treatment, occupation and treatment outcomes etc. were presented in frequency and percentages. Quantitative variables like age and duration of treatment etc. were presented as mean±SD.

RESULTS

Out of total 450 MDR TB patients analyzed in this study a higher proportion of 54.9% were males and 45.1% were females with a female to male ratio of 1:1.2. An overall mean age of patients remained to be 39.64±17.52 with mean age of females as 39.67±17.52 and for males as 39.64±17.54 years respectively. Further gender wise distribution of age shows highest proportion of MDR TB patients reside in age group of <25 years and lowest in age group of ≥65 years as shown in Table I.

General characteristics including related histories were also explored for study subjects and revealed that most of 303(67.3%) had a history of cat-I ATT followed by 88(19.6%) had history of cat-II treatment and only 59(13.1%) had no history of any treatment. History of smoking either hookah or cigarette was also found to be present 183(40.7%) of the patients while hstory of comorbidities was present in 62(13.8%) cases as presented in Table II. Further comorbidities include diabetes among 44 cases, viral hepatitis in 11 cases, heart disease in 5 cases, and chronic kidney disease was found in 2 patients. Most of 159(35.4%) patients had no skills and were labors of which 152(61.6%) were male labors and 7(3.5%) were female labors whereas most of 145 (71.5%) females were house wives. Clear difference in professions of male and female patients could be observed and many are completely dominated by male gender as compared to female gender. All the occupations of study subjects are presented in Table II.

Fig. 1: Treatment outcomes



Almost 71% (320/450) of the patients successfully completed the treatment including 45% (203/450) categorized as cured on the basis of availability of final smear and culture reports. Around 6% patients were lost to follow-up in this study, 5% remained failure from ATT and continued with symptomatic treatment and 18% patients of MDR TB were demised during course of ATT in this study as presented in figure.

Table I: Distribution of Age Groups Regarding Gender of MDR TB Patients.

Age Range (Years)	Male		Female		Total	
	n	%	n	%	n	%
15-24	40	16.2	74	36.5	114	25.3
25-34	45	18.2	38	18.7	83	18.5
35-44	34	13.8	31	15.3	65	14.4
45-54	65	26.3	15	7.4	80	17.8
55-64	36	14.6	21	10.3	57	12.7
≥65	27	10.9	24	11.8	51	11.3
Total	247	100	203	100	450	100

Table I: Characteristics of Patients Regarding Gender

Characteristics		Male		Female		Total (n=450)	
		n	%	n	%	n	%
Previous History of ATT	HRZE	169	55.8	134	44.2	303	67.3
	HRZES	47	53.4	41	46.6	88	19.6
	None	31	52.6	28	47.4	59	13.1
History of Smoking		139	76.0	44	24.0	183	40.7
History of Comorbidities		27	43.5	35	56.5	62	13.8
Mean Family Size		7.50±3.06		7.48±3.06		7.49±3.07	

Table II: Distribution of Occupation Regarding Gender in study Subjects

Occupation	Male (n=247)		Female (n=203)		Total (n=450)	
	n	%	n	%	n	%
Barber	5	2.0	-	-	5	1.1
Mechanic	2	0.8	-	-	2	0.4
Employee	6	2.4	2	0.9	8	1.8
Carpenters	3	1.2	-	-	3	0.7
Small Business	7	2.8	-	-	7	1.5
Driver	11	4.5	-	-	11	2.5
Farmer	20	8.1	-	-	20	4.5
House Wife	-	-	145	71.5	145	32.2
Imam Masjid	3	1.2	-	-	3	0.7
Journalist	1	0.4	-	-	1	0.2
Labor	152	61.6	7	3.5	159	35.4
Painter/Printer/Embroider	4	1.6	2	0.9	6	1.3
Student	12	4.9	34	16.8	46	10.2
Sweeper	2	0.8	-	-	2	0.4
Tailor	3	1.2	3	1.5	6	1.3
Teacher	2	0.8	1	0.5	3	0.7
Unemployed	9	3.7	7	3.5	16	3.6
Others	5	2.0	2	0.9	7	1.5

DISCUSSION

A high mortality rate of 18% was revealed among MDR TB patients, is in agreement with studies reporting 17% deaths in India[9] and 20% deaths in South Africa[10] with MDR TB. A sizeable numbers of deaths have been reported due to the MDR TB around the Globe. Low mortality rates of 6.5%, 6.4% and 3.9% were reported in studies from Tanzania[11], United Kingdome[12] and Switzerland[13] respectively hence are no comparable with present study. A variable degree of mortality rate among MDR TB patients was presented by two studies from Ethiopia, as a low of 18.3% by a recent study[14] and a high of 24.4% in an older study[15] thus in concomitant to present findings.

Occupation of patients is an important factor among TB patients and at present most of 159(35.4%) patients had no skills and was labors predominantly (152/159) consisted of males whereas most of 145 (32.2%) females were house wives. Clear difference in professions of male and female patients could be observed and many are completely dominated by male gender as compared to female gender. A retrospective study from India has also presented comparable results where proportion of housewives as 28.2% is in concomitant to present results whereas labors as 17.2% is almost half[16] as compared to present findings. Another study presented a high numbers of 45.3% semiskilled and 20.5% unskilled workers suffering from TB[17] is also in concomitant to present findings.

A period of ≥2 months lost to follow up among MDR TB patients results in poor treatment outcomes. It is also necessary to explore the timing of loss to follow up among MDR-TB patients. A study from United Kingdom reported around one sixth of MDR TB patients lost in their 3-11th month from start of their treatment[18], however not in agreement with present results which showed a very low of only 6% loss to follow up cases. Comparable results were presented by a study from Uganda which presented 8.8% lost to follow up[19]. A cohort analysis has also revealed comparable findings and presented an overall 8.66% loss to follow up with high heterogeneity in Ethiopia[20].

Prevalence of disease in different age groups, gender association and discrimination and treatment success rates of present study are also comparable with other studies[10-14].

CONCLUSION

Conclusively, adherence to treatment is the key of success in controlling TB and MDR TB as shown in present study however a high mortality rate of MDR TB patients is a big concern of health department and observation in relation to comorbidities is also essential in setting treatment regimen. As most of the TB patients in this study belong to labor which clearly indicates the loss of daily wages which must be the serious concern of authorities.

Conflict of interest: Nil

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