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ANALYSIS OF CO-MORBIDITY AMONG TUBERCULOSIS PATIENTS REGISTERED AT RURAL BANGALORE TUBERCULOSIS UNIT

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Abstract
Background: Co morbidities among Tuberculosis influences treatment outcomes. The present study was done with the objective, to assess the proportion of co-morbidities and treatment outcome of Tuberculosis cases registered for DOTS treatment at the Tuberculosis unit. **Methods:** A Descriptive study was conducted at a Tuberculosis Unit in Bangalore with 70 subjects selected by purposive sampling satisfying inclusion & exclusion criteria. Data was collected using a pretested semi structured proforma administered to all the study subjects by trained investigators. Data regarding profile of tuberculosis, medical co-morbidities were collected and these patients were followed up till their treatment completion and outcome of treatment was given based on new WHO definitions. **Results:** The present study showed that, 21 (30%) of the study subjects had one or the more co morbidities. DM was the most common co morbidity seen in 18(21.5%) patients. On determining the treatment outcome of the study subjects the overall treatment success rate was 87.1% which included the cured and treatment completed subjects. However there was no statistically significant association between treatment success and presence of co morbidity. **Conclusions:** Co morbidities needs to better addressed for successful treatment outcomes in Tb patients in the future programmes.
Keywords: *Tuberculosis, Co morbidity, Treatment outcome, Tuberculosis unit*

Introduction

Tuberculosis, an age old disease has been affecting the world in various forms causing a major health problem. The burden of the disease depends upon the geographical distribution. India accounts to a quarter of Global Tuberculosis burden.[1] Tuberculosis has been found to be co-exist with HIV infection and has also been included as AIDS defining illness. Multiple co-morbidities have also been associated with tuberculosis. [2] The developing countries face large burden of non- communicable disease, whic overlaps with unfinished agenda of communicable disease.[3]

Numerous demographic studies depicting actual proportion of Tb patients with comorbidity

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is the need of the hour.The present study aims to assess the proportion of co-morbidities among tuberculosispatients registered for treatment and to analyze the treatment outcomes.

Methods

A descriptive study was conducted from rural Bangalore Tb unit from January 2020 to December 2020.

Patients registered for treatment during the study period till the purposive sample of 70 subjects meeting inclusion criteria with patients aged above 18 years and subjects willing to participate and co- operate in study were included.

Confirmed patients for multidrug resistant (MDR) and extra drug resistant (XDR) tuberculosis were excluded.

Data was collected using a pretested semi- structured proforma, administered to all the study subjects by trained investigators. Data regarding demographic profile, profile of tuberculosis, medical co morbidities which the subjects were suffering from were collected and the patients were followed up till the treatment completion and outcome was recorded as per new WHO definition.[4] Treatment outcome for subjects of smear/sputum positive pulmonary tuberculosis was assessed in terms of cured and lost of follow up.

Results

The present study included 70 subjects with 46 (65.70%) males and 24 (34.30%) females. The mean age of the study subjects was 40.42 years. Pulmonary tuberculosis was seen in 44 (62.8%) and extra pulmonary tuberculosis was seen in rest 26 (37.20%) of the study subjects. Microbiology confirmed tuberculosis was established in 41(58.60%) and rest 29 (41.4%) was based on clinical diagnoses. Majority were newly detected cases 58 (82.80%) and rest were retreatment cases 12 (17.27%). Retreatment group analysis found that 6 (8.5%) had recurrent disease, 1 (1.4%) was due to loss of follow up and others few had unclassified reasons.

Association of HIV was seen in 4(5.7%) patients, rest were sero negative for HIV. All the patients were initiated on ART and only 1 patient had CD4 count of
<400 cells/mm^3among the HIV patients with tuberculosis.

Table 1: Distribution of study subjects based on co-morbidities

Co-morbidities	Number (n=70)	Percentage
HIV	4	5.7%
Diabetes Mellitus	15	21.4%
Hypertension	2	2.8%

Table 2: Risk Factors at diagnosis

Risk Factor	Number (n=70)	Percentage
Tobacco Smokeless	07	10%
Tobacco Smoking	03	4.2%
Alcoholism	06	8.5%

Table 3: Distribution of subjects based on treatment outcome

Treatment Outcome	Number (n=70)	Percentage
Cured	61	87.1%
Treatment failure	2	2.9%
Not evaluated	7	10%

Among patients with DM as co morbidity

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i.e. 15, 12 patients were having uncontrolled glycaemia at the time of diagnoses with random sugars >200mg/dl. Also all 15 of them were on regular ant diabetic medications prior to beingdiagnosed with Tb.

Active tobacco consumption was noted in 10 patients with majority i.e. 7 using smokeless tobacco form. However, the smokers (3) had quit smoking at the end of DOTS treatment. All the alcoholics i.e. 6 patients belonged to male sex and 4 patients continued to consume alcohol for the entire treatmentduration.

COVID-19 infection was noted in 27 patients of 70 patients in our study population during the treatment duration with no adverse outcomes reported.

Discussion

Population attributable fractions of TB from alcohol in India is high as 5-6.9%.[5]Poor treatment adherence, worse TB outcomes including death are reported in the past citing dependence , lack of integrity during alcohol usage among the patients.[6] Alcohol usage among Tb cases has been as high as 20% in the costal districts of Karnataka.[7] The present study has very few alcoholics with no adverse Tb outcome noted.

Proportion of Tb patients with DM in India has been as high as 20% in few studies, also few detected at the time of baseline investigation screening at the time of treatment initiation.[8] A study in Tamil Nadu reported nearly 50% of patients with Tb having DM or prediabetic status .[9]Also 14.8% of the Tb burden has been attributed to DM.[9] In the present study ,21% had DM as co morbidity.

Tuberculosis is given priority in India with major credits to National Programme which is constantly renewed. Although not so frequently reported in COVID-19 cases, mainly due to the lack of manpower, a review after pandemic would give better perspective.

As we are well aware of WHO target to reduce mortality due to tuberculosis by 95% and incidence by 90% by 2035.[10]Also in a country with huge population there exists a lot of non-communicable diseases. Shivalingaiah A.H. et. al. in their study from tuberculosis unit have reported 47.5% of patients with tuberculosis having any one of the co- morbidities like COPD, hypertension, diabetes mellitus, HIV and others.[11] The present study has found 18 number of participants have some or the other co-morbidity. Also Raghuram et. al. have found diabetes as high as quarter of the study population.[12] Occurrence of tuberculosis in patients of HIV is 13% as per global data whereas in India 5% of tuberculosis patients had HIV at the time of diagnosis.[13]

The present study had only 2 such cases of HIV along with tuberculosis. The lesser proportion of occurrence might be due to single tuberculosis centre data and small sample size. Other studies in India have reported 7.5-10% of tuberculosis patients with HIV.[11]

Diabetes has been attributed as an risk factor for active tuberculosis and as well precipitating factor for reactivation of latent tuberculosis. Also tuberculosis infection per se at large and drug to drug interactions were associated with increased co- morbidities like uncontrolled sugars or poorer outcome in subset of diabetes mellitus patients.[14]

Correlation between diabetes mellitus and tuberculosis was reported as unhealthy partnership with negative impact on tuberculosis control programme. [15] Uncontrolled diabetes (12/70) during diagnosis has been observed from the present study. Aggrawal et. al. also have reported 15.5% of their study group having dysglycaemia.[16]

Limitations

1. The study cohort appears poorer subset ofKarnataka population.
2. The subset analysis of COVID-19 NOT DONE

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3. Adherence of antidiabetic treatment was beyondscope of the study.
4. Lifestyle modifications imparted were not takeninto account for analysis.

Conclusion

Relook into Integration of National program can ascertain more lacunae's to curb the burden on health care system. The association of Tb patients with COVID-19 needs special attention specially post the ongoing 2nd wave of Pandemic in India. Regional data enables public health program to target high risk population to fight against TB. Co morbidities needs to better addressed for successful treatment outcomesin Tb patients in the future programmes.

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