A RETROSPECTIVE STUDY ON TREATMENT OUTCOMES OF TUBERCULOSIS PATIENTS UNDER RNTCP IN TERTIARY CARE CENTRE- KANYAKUMARI

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ABSTRACT

BACKGROUND
Tuberculosis remains to be a major public health problem in the world. This study sought to determine DOTS treatment outcomes and to investigate specific factors for unsuccessful treatment outcomes among TB patients to evaluate effectiveness of DOTS programme in our Kanyakumari district. According to the World Health Organization (WHO), treatment outcome is an important indicator for Tuberculosis (TB) prevention and control programme. We analysed the records of 227 sputum positive pulmonary tuberculosis patients (category 1) treated in our tertiary care centre serving to Kanyakumari District, from January, 2015 to December 2015.

MATERIALS AND METHODS
In this record-based retrospective study, sputum positive PT cases in KGMCH during the time period of January 2015-December 2015 were studied.[11] Data were collected from the RNTCP- District Tuberculosis Centre. Recorded information was entered in a precoded proforma and included age, sex, sputum status, category of DOTS, outcome and diabetic status. The total number of cases was 227.

RESULTS
Out of the 227 cases analysed, the treatment outcomes were categorised according to RNTCP guidelines during the study period. In this study, 78.8% were males and 21% were females. 59 cases (26%) were associated with type II diabetes mellitus. 6 were patients living with HIV/AIDS. We have achieved treatment success rate 84.59%, which is compatible with national target of 80%. However, certain proportion of people were defaulters, treatment failure and died, which were the serious public health concerns that needed to be addressed.

CONCLUSION
Therefore, treatment plans that emphasise Directly Observed Treatment Short course (DOTS) for at-risk patients have the greatest success in improving tuberculosis treatment outcome in the region. Urgent need for strengthening treatment outcome monitoring to ensure effective program implementation and case management system in the study area is strongly recommended.

KEYWORDS
Treatment Outcomes, Sputum Positive Tuberculosis Patients (Category 1).

BACKGROUND
Tuberculosis (TB) is one of the leading causes of death in the world. Globally, around 8.8 million people develop tuberculosis and 1.45 million people die every year due to TB, of which 0.35 million deaths are associated with HIV-TB

co-infection (WHO).[1] India is the country with the highest burden of TB. The World Health Organization (WHO) statistics for 2015 give an estimated incidence figure of 2.2 million cases of TB for India out of a global incidence of 9.6 million. The TB incidence for India is the number of new cases of active TB disease in India during a certain time period (usually a year).

The estimated TB prevalence figure for 2015 is given as 2.5 million.[1] The TB prevalence is the number of people in India who are living with active TB. Prevalence is usually, but not always given as a percentage of the population.

It is estimated that about 40% of the Indian population is infected with TB bacteria, the vast majority of whom have latent rather than active TB.[2] The WHO has implemented the Standardised Directly Observed Treatment, Short Course

(DOTS)/Stop TB Strategy to scale up TB prevention and control.[3]

Although, the WHO recommends routine culture and drug susceptibility testing for M. tuberculosis in order to effectively and timely follow-up on treatment outcomes, many developing countries including India, do not perform it. It has been shown that patients taking drugs directly under the observation of healthcare providers have a paramount importance in achieving a high treatment success rate of 96.5%. Besides the association of DOTS with treatment success rate, DOTS also aims to significantly decrease the occurrence of primary and acquired drug resistance and relapse (Weis et al, 1994). Even though the objectives of TB treatment are curing the patient, preventing the spread of tuberculosis infection and preventing the emergence of new drug-resistant strains.[4] These plans are not achieved in many regions of the world (WHO, 2003) due to several factors that affect treatment success. These includes the severity of disease, co-infection with HIV and/or other diseases, multidrug resistance, poverty and also the support provided to the patient.[3]

AIMS AND OBJECTIVES
This study is aimed at investigating the outcomes of tuberculosis treatment in sputum positive pulmonary tuberculosis patients and their associated risk factors.

Methodology
The study was conducted at Kanyakumari Government Medical College Hospital in Nagercoil, Kanyakumari District. The hospital is a tertiary healthcare level hospital serving the population of Kanyakumari District and nearby areas. In the hospital, DOTS clinic is operating under the Revised National Tuberculosis Control Program (RNTCP)[5,6] under which patients are diagnosed with tuberculosis by examination of morning sputum smears by modified Ziehl-Neelsen staining for the presence of Acid-Fast Bacilli (AFB), chest radiographs.[7] In this record-based retrospective study, sputum positive PT cases in KGMCH during the time period of January 2015-December 2015 were studied.[8] Data's were collected from the RNTCP- District Tuberculosis Centre. Recorded information was entered in a precoded proforma[9,10] and including age, sex, sputum status, category

of DOTS, outcome and diabetic status. The total number of cases was 227.

MATERIALS AND METHODS
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RESULTS
Of the total 227 cases, 179 were males (78.8%) and 48 were females (21%).

Most cases were among the age group 50-59 yrs. (28%). Out of the total cases, 59 were diabetic (26%).

Sputum status of 3+ was most common (72%) and it was also the most common in patients with diabetes mellitus (75%).

06 cases were people living with HIV/AIDS.

12 deaths were recorded (6%).

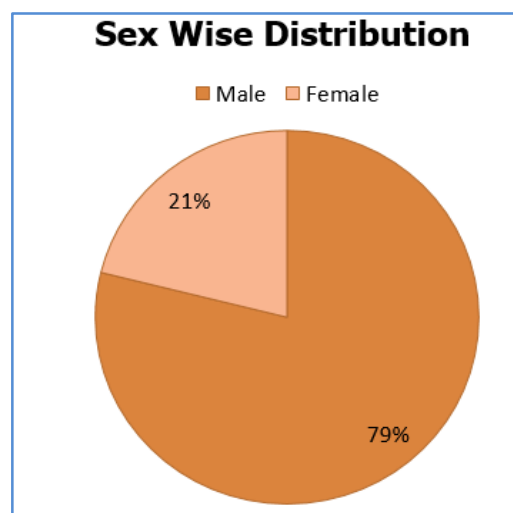19 cases were defaulters (9%).

04 cases were treatment failure (2%).

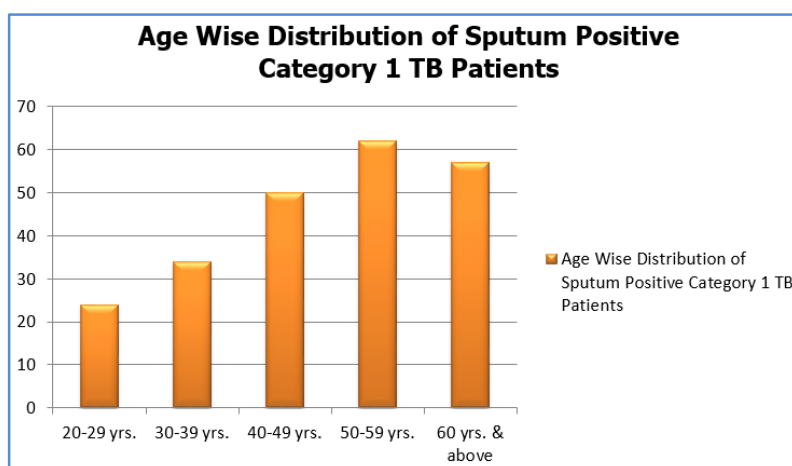**Figure 1. Sex Distribution**

Figure 2. Age Group Relationship

Patients with mean age greater than 39 had a significantly lower treatment success rate than other age groups.
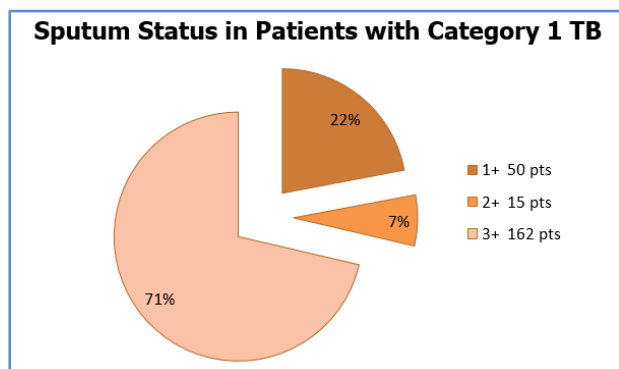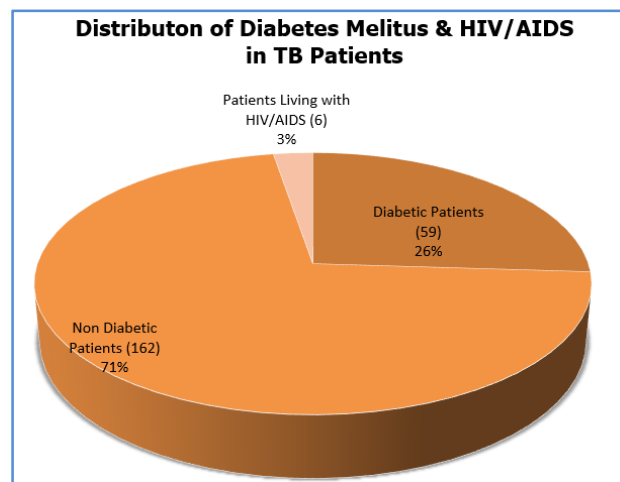

Figure 3. Sputum Status

Figure 4. Comorbidities in TB Patients

DISCUSSION

The present study found that the successful treatment rate of all tuberculosis cases treated at the DOTS Clinic in Kanyakumari Government Medical College Hospital was about 84.59%. Concurrent with other studies conducted in India (Chennaveerappa et al, 2011; Faustini et al, 2005),[5,9] this study also found a death rate of 5.28%.
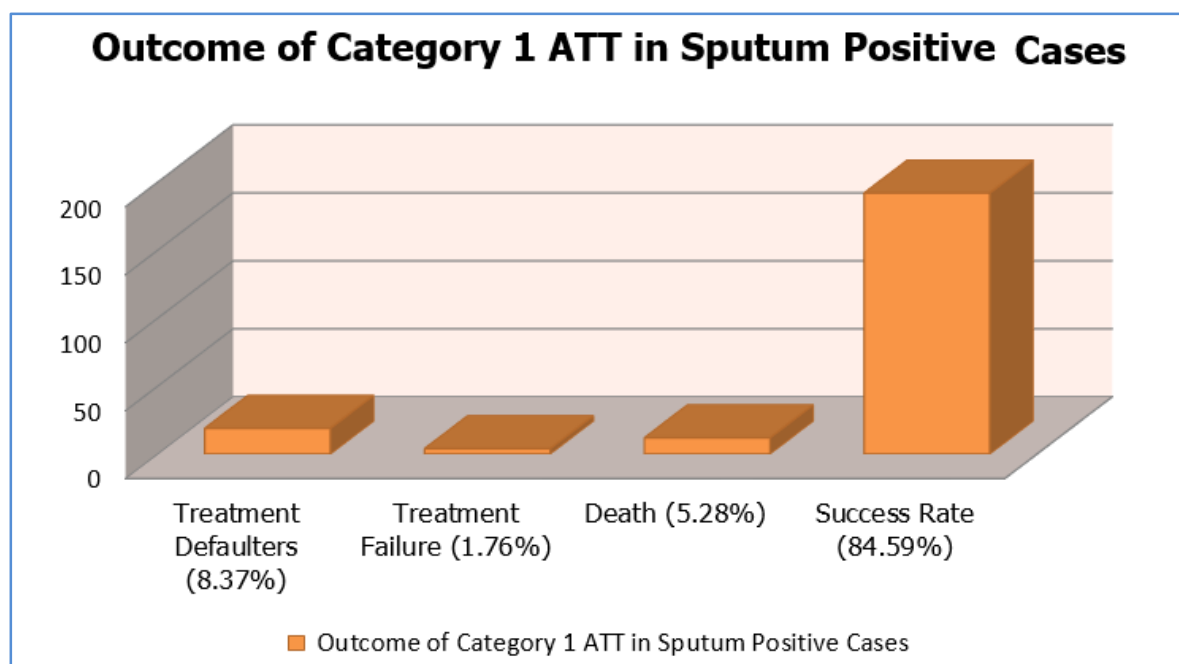

Figure 5. Outcome of Category 1 ATT in Sputum Positive Cases

Treatment defaulters rate is about 8.37%. Alcoholics and smokers often not taking care of their own health, usually has a poor diet, often complained of weakness after treatment are the main reasons for such high defaulters rate in this region.

Moreover, the death rate of patients steadily increased in older age groups. Older age has been reported to be a risk factor for death due to lowered immunity and comorbidities (Cayla et al, 2004). The defaulter rate in this study (8.37%).[12,13] Strengthening the monitoring, supervision and health education to reduce deaths and treatment interruption should be among the top priorities in the study region.

Close monitoring and health education for affected patients is of great importance. The patients in the mean age groups greater than 39 had a significantly lower treatment success rate compared to other age group. Older age has been reported to be a risk factor for death, partly due to co-infection and general physiological deterioration with age and thus it is crucial to exercise close monitoring of TB treatment also in older patients (Tessema et al, 2009).[14]

HIV infection increases the chance of tuberculosis reactivation and infection (Ramose et al, 2008). In this study, the HIV prevalence rate of 3% recorded among TB patients is much lower than the other reported studies.[11] The present study demonstrated that patients with PTB-HIV co-infection were more likely to have favourable treatment

outcome. Hence, special attention to HIV-positive TB cases is required in the study region.

In this study, we also found out that diabetes mellitus significantly increases the disease burden of TB.[15,12,13] Poorly-controlled diabetes can lead to multiple complications including vascular disease, neuropathy and increased susceptibility to infection. Diabetes might also lead to increased susceptibility to disease caused by M tuberculosis via multiple mechanisms. The mechanisms include those directly related to hyperglycaemia and cellular insulinopenia as well as indirect effects on macrophage and lymphocyte function leading to diminished ability to contain the organism.
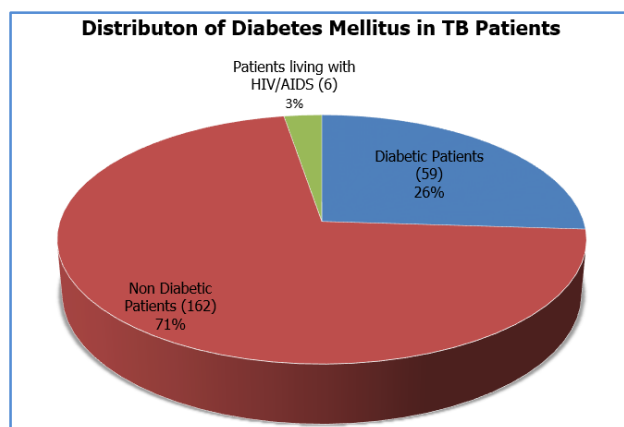

Figure 6. Distribution of Diabetes Mellitus in TB Patients

The most important effector cells for containment of tuberculosis are phagocytes (alveolar macrophages and their precursor monocytes) and lymphocytes. Diabetes is known to affect chemotaxis, phagocytosis, activation and antigen presentation by phagocytes in response to M tuberculosis. In diabetic patients, chemotaxis of monocytes is impaired and this defect does not improve with insulin. Diabetes might adversely affect T-cell production of interferon γ and T-cell growth, function and proliferation. Interferon γ potentiates the nitric-oxide-dependent intracellular killing activity of macrophages.

Infections including tuberculosis often worsen glycaemic control in diabetic patients and poorly-controlled diabetes might in turn augment the severity of infections.
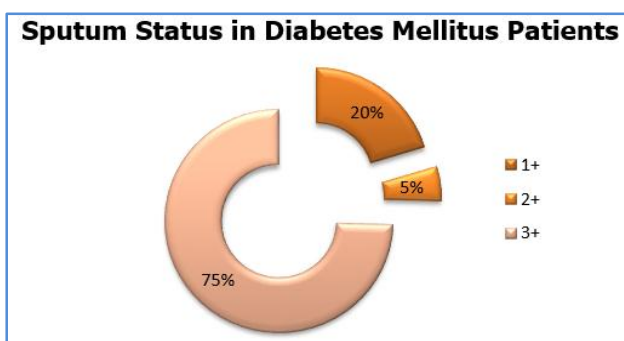

Figure 7. Sputum Status in Diabetes Mellitus Patients

Limitations

In this study, we have not included culture and sensitivity test for the treatment failure cases. Smear conversion rate maybe underestimated in the failure cases as some bacilli % in the sputum maybe dead bacilli. Also, due to other factors like alcoholism, social stigma, etc., treatment outcomes cannot be determined accurately.[2]

CONCLUSION

We conclude that treatment plans that emphasise DOTS for at-risk patients have the greatest success in improving tuberculosis treatment outcome in the region.

We were able to demonstrate from our data that HIV positive patients being treated for TB were associated with better treatment outcome. Urgent need for strengthening a coordinated tuberculosis control program and treatment outcome monitoring is strongly recommended.

Diabetes is a common comorbidity found in people with TB. A screening for all tuberculosis patients should be made mandatory.

Adequate education to the community and family members on DOTS strategies is recommended. DOTS program should be introduced in all private clinics as a priority as suggested by the WHO. Home visits by the DOTS workers should be encouraged especially targeting the working, elderly and severely ill patients.

TB will remain a major cause of morbidity and mortality, because of social issues like poverty, alcohol consumption, illiteracy, distance from health centres and stigma about the disease. These issues need to be addressed appropriately and aggressively so that the country could contribute significantly in achieving the WHO goal of reducing the global burden of TB and use of comprehensive approach will enhance the RNTCP programme.

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