CRITICAL ANALYSIS ON TUBERCULOSIS MORTALITY DURING 2005-2011 IN BATTICALOA DISTRICT, SRI LANKA

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ABSTRACT: Tuberculosis (TB) is a significant public health problem throughout the world and in Sri Lanka too. It is poses a continuing threat to the health and development of the people. Around 8500 – 9500 cases are detected annually in Sri Lanka. In the recent past, the TB mortality rate has significantly increased in Batticaloa district in comparison to the national value (Mortality rate in 2009, National figure 2.4/100,000 Population and 3.35/100,000 Population for Batticaloa district but in 2010 rate was 4.51/100,000 Population for Batticaloa district however National figure is 2.5/100,000 Population).This investigation aimed to, identify the age group vulnerable for death due to TB, recognize the areas in Batticaloa district that are more prone to contracting TB, determine the influence of predisposing factors and co- morbidities contribute to the death and designed to analyze the diagnostic criteria of tuberculosis at Chest Clinic and Teaching Hospital,Batticaloa. Data obtained from chest clinic records and by interviewer administered questionnaire of close relatives of the diseased cases. Statistical analysis was performed by statistical software (SPSS 16.0) and the p-value < 0.05 was considered significant for all analyses. The most vulnerable age group of death identified as 55– 64 years (30.4%). The significant higher death rate (27.3%) occurred in Kaluwanchikudy Medical Officer of Health (MOH) division. Smoking habit and alcohol consumption were recognized as significant predisposing factors of death. The significant co-morbid to the death was bronchial asthma (45.5%). Death due to tuberculosis has been found to be higher than the national figures in the years under study. A typical laboratory dedicated for detection of TB should be established in Batticaloa as it is essential to perform all diagnostic tests for TB to avoid the unnecessary delay in diagnosing the disease and initiating treatment to avoid unwanted death.

Keywords: TB, Death due to TB, DOTS

1. INTRODUCTION

Tuberculosis (TB), caused by ***Mycobacterium tuberculosis*** is existing as significant communicable disease throughout the world, particularly in the developing countries. TB is the preventable and curable disease when adhere to appropriate protocols of prevention, even though it is the leading killer of immuno-compromized patient, however none of the country has ever eliminated TB yet.

Sri Lanka has come to the forefront from among 11 South East Asian countries with regard to several health indices according to the 2010 world health situation report published by the World Health Organization (WHO). However; Sri Lanka comes second to Maldives in TB deaths. In Sri Lanka, the treatment success rate has been estimated to have reached 85% in year 2005, however the death rate has been increasing from 3.7 to 5.9 since year 2000 to 2008. In the recent past, the TB mortality rate has increased in Batticaloa district in comparison to the national value.

There are currently two systems for reporting deaths due to TB: through reporting from hospitals and through reporting under Directly Observed Therapy Short course (DOTS) with some overlap between the two systems. The DOTS mortality figures only include patients who die of any cause including TB.

The objectives of this study were, identify the age group vulnerable for death due to TB, recognize the areas in Batticaloa district that are more prone to contracting TB, determine the influence of predisposing factors of TB contributing to the death, determine the influence of co- morbidities contribute to the death and analyze the criteria used to diagnose TB on the study population.

2. METHODOLOGY

This was a retrospective descriptive study, carried out at the Chest Clinic, Batticaloa in 2012. Study population was all TB patients registered at Chest Clinic, Batticaloa who died during anti tuberculosis treatment (ATT), irrespective of cause of death during the period of 2005 to 2011.

Data collection was done by the researchers from the chest clinic records. Additional data was obtained from the close relatives of the deceased via a pre-tested interviewer administered questionnaire. Informed written consent was obtained from the respondents prior to the interview. Data was analyzed by statistical software (SPSS 16.0) and the p-value < 0.05 was considered significant for all analyses. Ethical approval was obtained from Ethical Review Committee, Faculty of Health - Care Sciences, Eastern University, Sri Lanka.

3. RESULTS AND DISCUSSION

Data of a total number of 129 patients died during anti tuberculosis treatment from 2005 to 2011 were collected. Highest (21.7%) and lowest (9.3%) mortality rate was recorded in 2010 and 2005 respectively. Predominantly male patients (X^2= 23.450, P=0.000) died compared to the female patients. Fifty three (41.4%) patients died at hospital and seventy six (58.6%) patients were died at home.

Figure 1. Comparison of mortality due to year

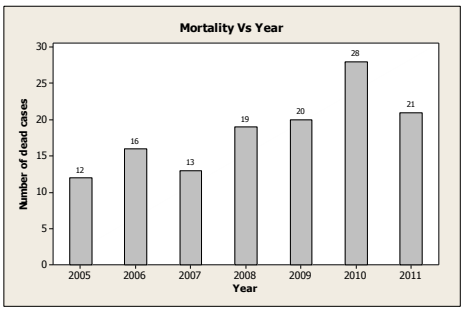


Figure 2. Comparison of mortality due to sex

Of these 129 patients; 100 patients (82.0%) , 14 patients (11.5%), 6 patients (4.9%) and 2 patients (1.6%) were classified according to type of patient as new, relapse,

treatment after default and treatment after failure respectively. Among the classification of the patients statistically significant (X^2= 213.607, P=0.000) differences were noticed.

Figure 3. Comparison of mortality due to type of patient

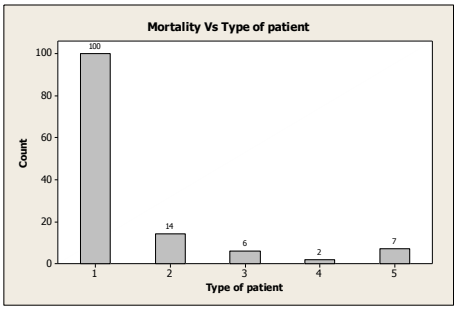
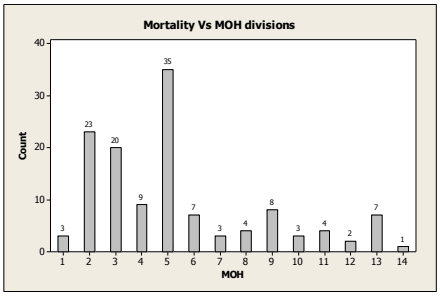


Figure 4. Comparison of mortality due age

Patients were categorized into age sub groups according to following range in years; 0 - 14, 15- 24, 25 - 34, 35 - 44, 45 - 54, 55 -64, 65 - 74 and over 75. Differences between age groups were statistically significant (X^2= 80.120, P=0.000) with the most vulnerable age groupfor death being 55 - 64 (30.4%).
Among the 13 Medical Officer of Health (MOH) divisions over 15% of death occurred in Kaluwanchikudy (27.3%), Batticaloa (18.0%) and Chenkalady (15.6%) divisions and less than 3% were reported in Arayampathy (2.3%) Kiran (2.3%), Vaharai (2.3%) and Vavunativu (1.6%) divisions. The differences among the MOH divisions was identified statistically significant (X^2= 121.844, P=0.000).

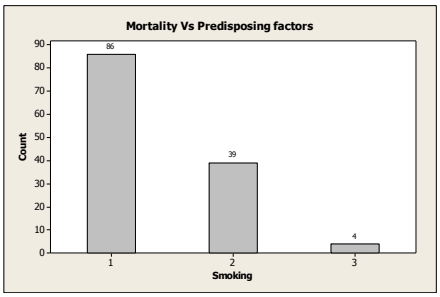
Figure 5. Comparison of mortality due to MOH divisions

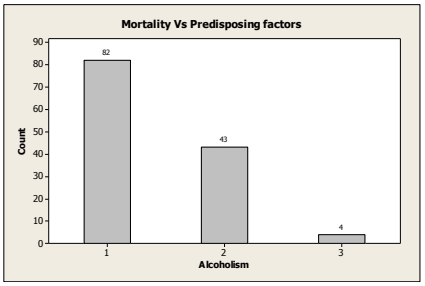


Smoking as the predisposing factor of tuberculosis was found in eighty six (68.8%) patients while eighty two (65.6%) patients were found to consume alcohol. Statistically significant differences observed with smoking habit (X^2= 17.672, P=0.000) and alcohol (X^2= 12.168, P=0.000) consumption of the diseased.

Figure 6. Comparison of mortality due to smoking habit

Figure 7. Comparison of mortality due to alcoholism

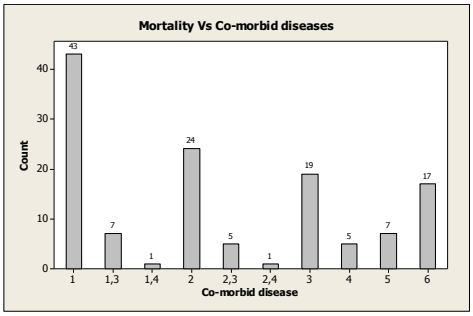


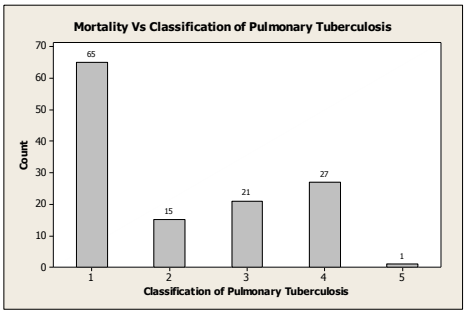


102 patients (86.8%) of the diseased had co-morbidities such as bronchial asthma (45.5%), chronic obstructive pulmonary disease (COPD) (26.8%), diabetes mellitus (17.0%), chronic kidney diseases (6.2%) and malignancy (4.5%). The differences among the different types of co-morbidities contributing to the death was statistically significant (X^2= 63.714, P=0.000) with highest prevalence of bronchial asthma.

Figure 8. Comparison of mortality due to co-morbidities

Figure 9. Comparison of mortality due to PTB subtypes

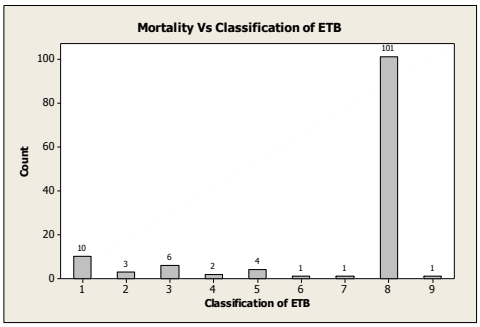


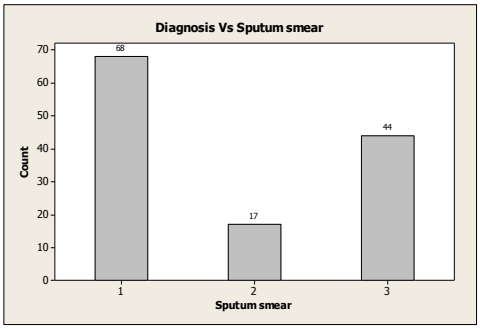


Among the total 129 patients, 101 patients (78.9%) were diagnosed as Pulmonary Tuberculosis (PTB) while in 27 patients (21.1%) the diagnosis was Extra Pulmonary Tuberculosis (EPTB). Pulmonary Tuberculosis (PTB) further divided into sub categories as Pulmonary Tuberculosis (PTB SS+) with sputum smear positive (50.8%) and Pulmonary Tuberculosis (PTB SS-) with sputum smear negative (28.1%).

Figure 10. Comparison of mortality due to types of ETB

Figure 11. Comparison of diagnosis due to sputum smear





Differences among classification of tuberculosis (X^2= 42.781, P=0.000) and sub categorization of PTB (X^2= 18.484, P=0.000) were observed with statistical significance. Twenty seven (21.1%) Extra Pulmonary Tuberculosis (EPTB) patients classified as EPTB meningitis, EPTB peritonitis, EPTB spine, EPTB milliary, EPTB pleural effusion, EPTB axillary lymph node and EPTB inguinal lymph node with ten (37%), three (11.1%), six (22.2%), two (7.4%), four (14.8%), one (3.7%) and one (3.7%) patients respectively.

Figure 12. Comparison of diagnosis due to culture report

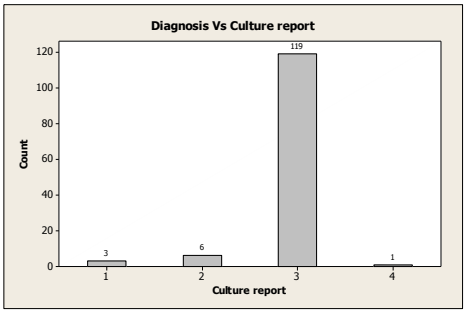
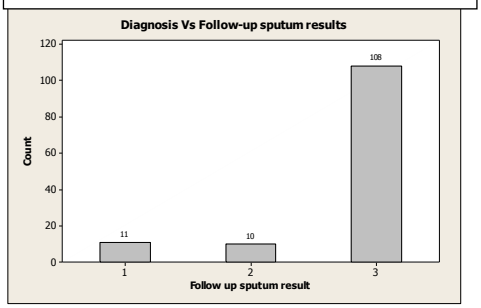


Figure 13. Comparison of diagnosis due to follow-up sputum results



Sputum smear, chest x-ray and clinical features have been used as criteria to diagnose TB in all patients. Sputum smear was positive (SS+) in 66patients (51.2%) and sputum smear negative (SS-) in 63patients (48.8%).Abnormalities in chest X-ray were found in 6patients (4.6%). In 22 patients (17.1%) sputum culture has been done for the diagnosis.

Figure 14. Comparison of diagnosis due to chest x-ray

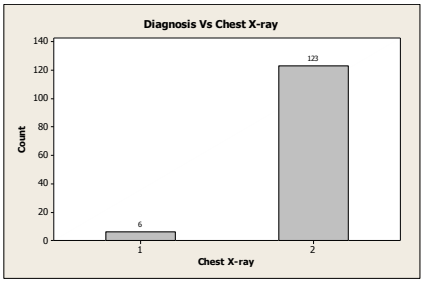


Figure 15. Comparison of mortality due to occupation

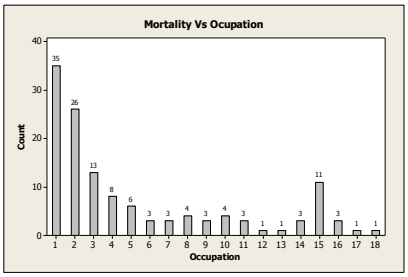
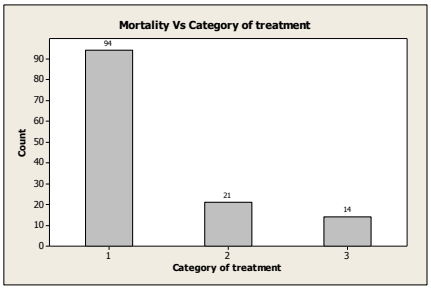
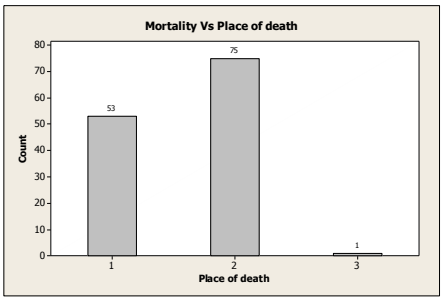


Figure 16. Comparison of mortality due to culture report

Figure 17. Comparison of mortality due to place of death





4. CONCLUSION

Death due to tuberculosis has been found to be higher than the national figures in the years under study. Death rate has been increasing over the years despite implementation of DOTS. Sputum smear, chest x-ray, sputum culture and clinical features were used as criteria to diagnose PTB while clinical features were the main stay of diagnosis in EPTB. These coincide with criteria provided by Ministry of Health, Sri Lanka and World Health Organization (WHO) for diagnosis of tuberculosis.

The most vulnerable age group was 55 - 64 years (30.4%), therefore concern towards this target group is very important to reduce the mortality. Tuberculosis prevention and control programs should be strengthen in MOH areas reported high death rates as there would be more cases with TB in these areas.

Smoking habit and alcohol consumption appears to have a greater impact on the death of these patients as over 65% of them have consumed these substances. Health awareness and promotions on the ill effects of smoking and alcohol should be emphasized. Co-morbidities appears to play a significant role in the death of TB. The influences of diseases such as bronchial asthma, diabetes mellitus contributing to the death need further interventional programs to avoid the severe and fatal complications on TB patients.

Early diagnosis and initiating treatment should reduce the death due to TB. A typical laboratory dedicated for detection of TB should be established in Batticaloaas it is essential to perform all diagnostic tests for TB to avoid the unnecessary delay in diagnosing the disease and initiating treatment.

5. REFERENCES

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