

A Retrospective Study of Death Among Patients Treated for Tuberculosis in the Klang Chest Clinic for the Year 1999

B Venugopalan, MPH*, P Rajendra, M.Med (Public Health)*, * Epidemiology Unit, Selangor Health Department, Shah Alam, Selangor

Summary

A retrospective epidemiological study was done on 41 deaths among patients treated for TB in the Klang Chest Clinic for the year 1999. The findings revealed a male preponderance of TB deaths with Indians having the highest case fatality rate (8.6%). The majority of deaths occurred within the 25-44 year age group. Of those cases diagnosed as Pulmonary TB, 69% were diagnosed as far-advanced, at presentation, based on chest x-rays reported. Eighty three percent of these patients were still on treatment when they died. HIV was the most common co-existing disease condition and was implicated in 14.6% of the deaths. The recommendations include implementation of clinical guidelines on TB screening for HIV patients, a study to evaluate the effectiveness of the current TB surveillance programme and for chest x-rays of all sputum smear negative patients to be reported by the radiologist to reduce the risk of misdiagnosis.

Key Words: TB deaths, Far advanced, HIV

Introduction

Annually, tuberculosis (TB) infects about 8 million individuals worldwide annually with about 3 million deaths¹. Most of these infections occur in developing countries (90%) where it contributes to marked morbidity and mortality. The worldwide situation was observed to deteriorate and this caused the World Health Organization, WHO, to declare TB a global emergency in 1993.

This state of affairs is unfortunate considering the fact that about 30 years ago, the medical fraternity was confident that TB could be effectively controlled, and even eradicated, with the introduction of cheap and effective anti-tuberculous drugs and the rise in living standards. Reasons for the resurgence in TB cases are the

Human Immunodeficiency Virus (HIV) pandemic², increase in multi-drug resistant (MDR) TB due to poor treatment surveillance³ and major social upheavals such as war, floods and famine.

In Malaysia, the incidence of TB cases had dropped from 68.2/100,000 in 1985 to 65.6/100,000 in 1999⁴. The total number of cases notified nationally over the last 5 years had hovered around 11,000 to 15,000 cases annually. The national crude death rate (TB) was 3.8/100,000 in 1999 and HIV contributed to about 24% of these deaths⁴.

In Selangor, the prevalence of TB cases registered in the chest clinics have ranged from 400-600 cases annually, giving an incidence rate of 15.3-21.3/100,000 for the period 1996 to 1999^{5,6,7,8}. The mortality rate has ranged

from 1.84/ 100,000 to 2.5/ 100,000 for the period 1996- 1999 and HIV infection contributed to 29% of these deaths in 1999⁸. The main purpose of this study was to investigate the epidemiological pattern of deaths among patients treated for TB in the Klang chest clinic for the year 1999.

The Klang chest clinic is located in the centre of Klang town. Its catchment area includes Klang, Petaling and Kuala Langat district. It is one of the busiest chest clinics in the state with 594 TB cases treated in 1999. Of these 384 patients (64.6%) were males and females comprised 210 cases (35.4%).

Materials and Methods

All deaths among patients treated for TB in the Klang chest clinic for 1999 were notified to the Epidemiology Unit, Selangor Health Department using a standardized format. The data from these forms were later analysed by the author using the Epi Info Version 6.04 computer programme.

All the TB treatment case notes (Tbc.22) were traced to enable better analysis of the patients who had died while on treatment. Twenty-two ward case notes of these patients who had died in Hospital Klang were also traced to enable a more detailed clinical analysis of the cause of death.

Thirty- seven chest x-ray films were traced, read and classified by a single radiologist in Hospital Klang based on the criteria provided by the National Chest Institute, Kuala Lumpur (formerly the National Tuberculosis Control Centre). Two chest x-rays of patients with pulmonary TB were not obtained while chest x-ray reports were not done for 2 patients with extra- pulmonary TB (spine, meninges).

Limitations

The main limitation in this study was the fact that this study is biased towards patients who were treated in government health facilities and registered in the Klang Chest Clinic. It is acknowledged that a proportion of TB patients in this area were treated in private hospitals/ clinics and the mortality data for these cases was not

available. The other limitation is the fact that this is a retrospective study and some of the forms analysed may be incorrectly/ incompletely filled, especially the cause of death. It is also possible that there were errors in data compilation and analysis.

Results

There was a total of 41 deaths among patients treated for TB in the Klang chest clinic for 1999. Of these, males accounted for 75.6% (31) of the total number of cases with a case fatality rate of 8.1% while females had a case fatality rate of 4.8%. Twenty-six (63.4%) of these patients were married.

The ethnic breakdown of these patients is shown in Figure 1.

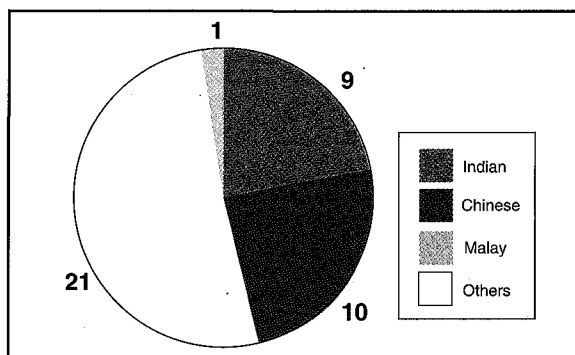


Figure 1: Ethnic Breakdown of Deceased Patients Treated for TB

The ethnic case fatality rate calculated based on the total number of patients treated in Klang Chest Clinic for the year 1999 is summarised in Table I.

Table I
Ethnic case fatality rate of patients treated for TB in Klang Chest Clinic for 1999

Ethnic Group	Case Fatality Rate
Malay	7.9%
Chinese	7.4%
Indian	8.6%
Others	2.1%

DEATH AMONG PATIENTS TREATED FOR TUBERCULOSIS

The age profile of the patients is shown in Figure 2.

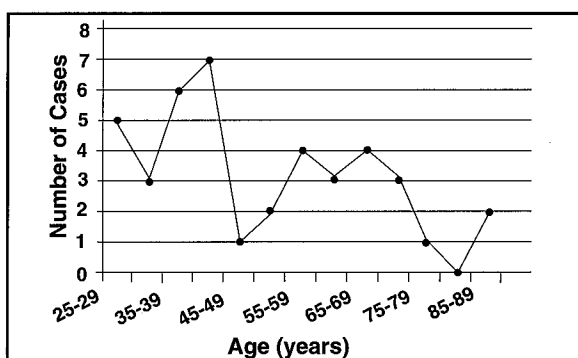


Figure 2: Age Profile Of Deceased Patients Treated for TB

The mean age of these patients was 50 years with a standard deviation of 17 years. As for the type of disease finally diagnosed, 31 (75.6%) had pulmonary TB, 2 (4.9%) were extra pulmonary TB (spine, meninges) and 8 (19.5%) had other illnesses (e.g. cancer, systemic lupus erythematosus (SLE), lymphoma, sarcoidosis). With respect to the sputum smear status for acid-fast bacilli (AFB) for those patients with pulmonary TB, 12 (38.7%) were sputum smear positive, 11 (35.5%) were sputum smear negative and 8 results (25.8%) could not be traced. Of these cases, 3 cases (7.3%) were relapse pulmonary TB cases. There were no reports of TB drug resistance among these cases. The status of treatment at the time of death is shown in Table II.

Table II
Treatment status at time of death
of patients treated for TB

Treatment Status	Number (%)
Completed Treatment	1 (2.4%)
On Treatment	33 (80.5%)
Defaulted Treatment	4 (9.8%)
Abandoned Treatment	3 (7.3%)

Of the 37 radiological reports of chest x-ray traced, 29 were diagnosed radiologically as pulmonary TB. Of these, 20 (69%) were classified as far advanced, 5 (17.2%) were noted as moderate and 4 (13.8%) were classified as minimal changes. Chest x-rays of six patients (16.2%) were diagnosed to have other ailments

(e.g. carcinoma, sarcoidosis, lymphoma) while 2 patients (5.4%) had normal chest x-rays.

The period between commencement of treatment and death of all these patients ranged from 1 day to 673 days (TB spine) with an average of 105 days and a standard deviation of 132 days. For those who were currently on treatment (excluding those who completed, defaulted and abandoned treatment), the period between commencement of treatment and death ranged from 1 day to 673 days with a mean of 98 days and a standard deviation of 142 days.

Of the co-existing illnesses contributing to TB mortality, 10 patients (24.4%) were HIV positive, four (9.8%) were diabetic and three (7.3%) had renal impairment. The underlying causes of death of these patients are summarised in Table III.

Table III
Underlying cause of death of patients treated
for TB in the Klang Chest Clinic for 1999

Cause of Death	Number (%)
1. PTB	22 (53.7%)
2. PTB with HIV	6 (14.6%)
3. Extra-Pulmonary TB	2 (4.9%)
4. Other Causes	10 (24.4%)
5. Unknown (found dead)	1 (2.4%)

Discussion

Gender/ Ethnic Group/ Age Distribution

There was a preponderance of TB deaths among males, which was also related to their higher case fatality rate, which could not solely be related to the higher proportion of TB among males. These deaths give an indication of the socio-economic impact of TB, as most of these individuals are within the productive age group and the fact that 63% of the TB patients who had died were married.

The ethnic case fatality rate for TB showed that Indians had the highest rates followed by the Malays and Chinese. The age profile of TB deaths revealed that about 51% of the deaths occurred among the age groups of 25- 44 years. This fits the epidemiological pattern of

TB diagnosed in the state and dispels the notion that TB is primarily a disease of the elderly, who succumb, in greater proportions to this disease. Some of these deaths among the younger population could be attributed to co-existing HIV infection.

Site Of Infection/ Sputum Status/ X- Ray/ Treatment Duration

Pulmonary TB accounted for about 76% of the deaths reported. Thirty nine percent of these were sputum positive. A review of the chest x-ray, on diagnosis, of these patients showed that the majority (69%) had far advanced changes, followed by moderate changes (17.2%) and minimal changes (13.8%). The disturbing finding is that eight chest x-rays (21.6%) were reported to be of other illnesses or normal. Seven of these patients were sputum smear negative while one patient's sputum smear status could not be traced. Moreover, eighty-three percent of these patients were on adequate treatment while 17% had defaulted/ abandoned treatment at the time of death. Of those patients on treatment, 34% died within one month of commencement of treatment.

All these indicate that one should evaluate critically the effectiveness of the current surveillance programme in detecting TB patients at an early stage of infection. This advanced stage of infection could account for the deaths in spite of a high percentage of these patients on adequate treatment. One contributing factor could be the co-existent HIV infection which could lead to a worse prognosis although it is reported that with early diagnosis and effective treatment, the cure rates approach that of the HIV negative patients, if not severely immunocompromised.

The fact that that a sizeable proportion of patients treated for TB (sputum smear negative) were found to be having other diseases support the suggestion that more stringent criteria must be followed in diagnosing TB under these circumstances. One of the most practical measures that can be immediately implemented is to ensure that all chest x-rays of these patients (sputum smear negative) are reported by a radiologist. In this study, it was found that only 5 chest-rays out of 37 films traced (13.5%) were sent for reporting by the radiologist (3- sputum smear negative, 2- sputum smear positive) during treatment of these patients.

Co- Existing Disease

HIV infection was the most common co-existing disease (24%) followed by diabetes (9.8%) and renal impairment (7.3%). The analysis of the immediate cause of death indicates that HIV with PTB accounted for 14.6% of the deaths. This follows PTB, which accounted for 53.7% of the deaths due to primarily respiratory complications and deaths due to other ailments (24.4%). This serves to highlight the importance of screening all HIV individuals periodically for TB especially in special institutions such as prisons and drug rehabilitation centres. Deaths due to other ailments could be reduced by ensuring the chest x-rays, especially of sputum smear negative patients, were reported by the radiologist so that these diseases could be diagnosed early.

Recommendations

- a) It is recommended that chest x-rays of all sputum smear negative patients be reported, routinely, by a radiologist to exclude other lung pathologies.
- b) Implementation of clinical guidelines recommending the screening of all HIV patients for TB should be followed especially in prisons and drug rehabilitation centres.
- c) Defaulter and abandonment rates of TB treatment should be kept to a minimum with an effective retrieval system being operationalised.
- d) A study should be performed to evaluate the effectiveness of the current TB surveillance programme to ascertain the reasons for the detection of patients at a far-advanced stage of the disease.

Acknowledgments

We would like to express our gratitude to the Director General of Health for the permission to publish this paper. We would also like to thank the following individuals who had assisted us in the completion of this study:

1. Dr Chuah Siew Kee- Consultant Physician, Hospital Klang.

2. Dr Puspha Ramanathan- Consultant Radiologist, Hospital Klang.
 3. Mohd. Jaafar Aman- Medical Assistant, Klang Chest Clinic.
-

References

1. A. Zumla, John M. Grange. Doing something about tuberculosis; BMJ 1999; 318: 956.
2. Janet H. Darbyshire. Tuberculosis: old reasons for a new increase?; BMJ 1995; 310: 954-55.
3. Janice Hopkins Tanne. Drug resistant TB is spreading worldwide; BMJ 1999; 319: 1220.
4. Ministry of Health, Malaysia. National TB/ Leprosy Control Programme- Annual Report 1999.
5. Selangor Health Department, Malaysia. State TB Control Programme- Annual Report 1996.
6. Selangor Health Department, Malaysia. State TB Control Programme- Annual Report 1997.
7. Selangor Health Department, Malaysia. State TB Control Programme- Annual Report 1998.
8. Selangor Health Department, Malaysia. State TB Control Programme- Annual Report 1999.
9. Rudi C, Dermot M, Hernan R, Malgosia G. Tuberculosis in prisons in countries with high prevalence; BMJ 2000; 320: 440-2.