

An Evaluation of the Tuberculosis Control Programme of Selangor State, Malaysia for the Year 2001

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Summary

In the year 2001, 1459 Tuberculosis (TB) cases (43.1/ 100,000 population) were notified in Selangor. The highest age specific incidence rate was among those aged above 60 years and foreigners accounted for 15% of the cases notified. Fifteen percent of the TB cases were treated in the private sector where treatment efficacy and compliance could not be evaluated. Co- infection of Human Immunodeficiency Virus (HIV) infection with TB accounted for 51% of the TB deaths notified. Screening programmes in prisons and drug rehabilitation centres had detected 11.7% of HIV/TB co-infection among HIV positive inmates screened in these institutions.

Key Words: TB/ HIV co infection, Early detection, Compliance

Introduction

Tuberculosis (TB) is still a major public health challenge in Malaysia with about 15,000 cases being notified in the year 2000¹. The national incidence rate was 65 per 100,000 for the year 2000 with a mortality rate of 4 per 100,000 population¹. The National TB control programme was established as a vertical programme in 1961 and was later integrated into the general health services in 1994.

Selangor is one of the 14 states in Malaysia. It represents the most developed state in Malaysia and is comprised of 9 districts with a population of 3.4 million in 2001². The population consists mainly the Malays (47%), followed by the Chinese (29%) and Indians (14%). There is also a substantial immigrant population (5.1%) working in the construction and plantation sector².

TB in Selangor has been noted to be on the increase since 1999 with cases increasing from 1023 cases to 1459 cases in the year 2001. Some of the postulated reasons for this increase were the increasing co-infection of Human Immunodeficiency Virus (HIV) with TB, poor implementation of the TB control programme and the influx of foreigners into the community. The current emphasis of the control programme is towards early diagnosis of TB and to ensure adequate compliance to treatment.

The objectives of this evaluation were to establish the state TB incidence rate, ethnic and gender incidence rate, age specific incidence rate and mortality rate for Selangor state for the year 2001. This study had also the objective of determining where the TB patients were treated, the treatment compliance rate, TB mortality rate, the outcome of active case detection by sputum smear screening in outpatient clinics and finally to evaluate the

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TB/Human Immunodeficiency Virus (HIV) screening programme in prisons and drug rehabilitation centers in the state.

Materials and Methods

Two databases had been used in the evaluation of the TB control programme in Selangor state for the year 2001. These were from the TB cases notified by all medical practitioners through the communicable diseases control (CDC) notification system, which is mandatory by law, and from the treatment databases of TB patients treated in the government centers in Selangor.

The evaluation was limited by the fact that details about TB patients treated in the private health centres and "out of state" government centres were not available for analysis.

Results

Incidence Rate

There were 1459 TB cases (all forms) notified in the year 2001. This gave an incidence rate of 43.1/ 100,000 population. Of these cases, 97.8% were classified as Pulmonary TB, 1.9% Extra Pulmonary TB and 0.3% were of both forms. Of the cases of pulmonary TB, 81.8% were found to be sputum smear positive.

The incidence rate according to ethnic groups was as follows: -

Indians:	41.6/ 100,000 population
Malays:	39.7/ 100,000 population
Chinese:	29.3/ 100,000 population
Others:	24.8/ 100,000 population
Foreigners:	126.7/ 100,000 population

The gender profile was males had an incidence rate of 53.8/ 100,000 population while females had an incidence rate of 27.3/ 100,000 population. The female to male ratio was 1:2.

The age specific incidence rate was as follows (Figure 1)

TB Cases by Place of Treatment (Table I)

Severity of Chest X-Ray on Initial Diagnosis of Pulmonary Tuberculosis (Figure 2)

Abandoned Treatment Rate and TB Mortality Rate

A total of 164 TB patients, on treatment in government health facilities in Selangor, had abandoned treatment (off medication for more than 1 month) in the year 2001 and this was 11.6% of the total TB patients on treatment in government health facilities in Selangor.

A total of 97 TB patients were notified to have died during treatment in this year and the TB mortality rate was 2.3/ 100,000 population. There were a total of 98 patients with HIV/TB co-infection and 50 deaths (51% of all TB deaths) were attributed due to HIV/ TB co-infection.

TB Screening at Prisons/ Drug Rehabilitation Centres (Table II)

Active Case Detection in Government Health Clinics

Of a total 922,832 patients treated in the government outpatient clinics in Selangor for the year 2001, 3007 (0.3%) were screened by sputum smear examination. Of these, 150 patients (5%) were detected to be sputum smear positive for TB.

Bacillus Calmette- Guerin (BCG) Vaccination Programme

The BCG vaccination coverage was 98% of the total live births in the state. A total of 1021 children were given primary BCG immunization after the age of 1 year. The BCG vaccination coverage in primary 1 and 6 were 99.8% and 99% respectively.

Table I: TB Cases in Selangor by Place of Treatment

Palace of treatment	Number (%)
Government Chest Clinics, Selangor	708 (48.5%)
Institute of Respiratory Medicine, Kuala Lumpur	403 (27.6%)
Private Medical Centres, Selangor	215 (14.7%)
University Malaya Medical Centre, Kuala Lumpur	117 (8.1%)
"Out of state" Government Chest Clinics	16 (1.1%)
Total	1459 (100.0%)

Table II: TB Screening among HIV Positive Inmates at Prisons/ Drug Rehabilitation Centers in Selangor for the year 2001

	HIV Positive Inmates Detected	X-Ray/Sputum Smear Screening for HIV + Inmates	HIV/TB Cases Detected among HIV + Inmates Screening
Prisons	1739	412	45
Drug Rehabilitation Centers	118	76	12
Total	1857	488 (26.3%)	57 (11.7%)

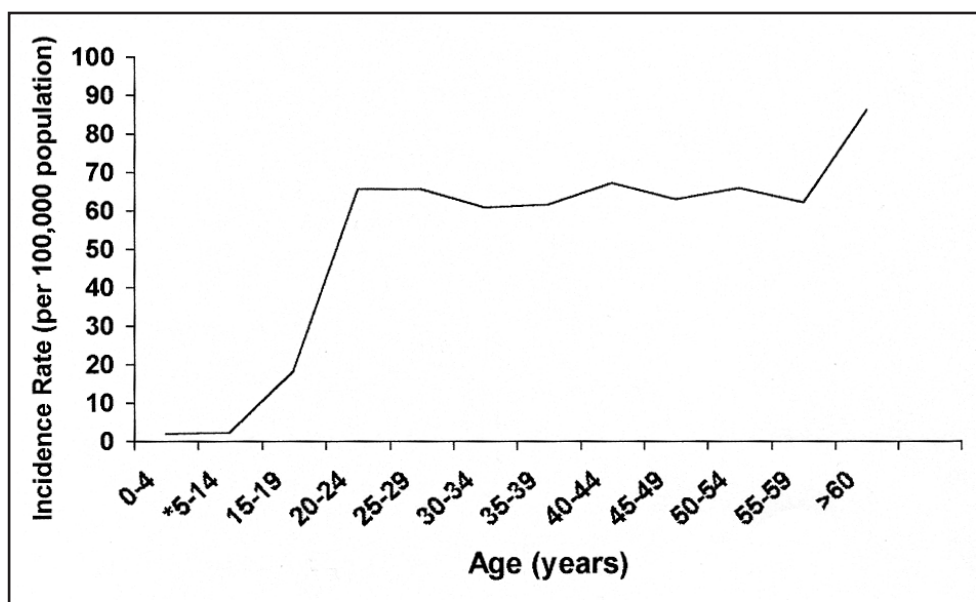


Fig. 1: Age Specific Incidence Rate (per 100,000 population) of TB patients notified in Selangor for the year 2001.

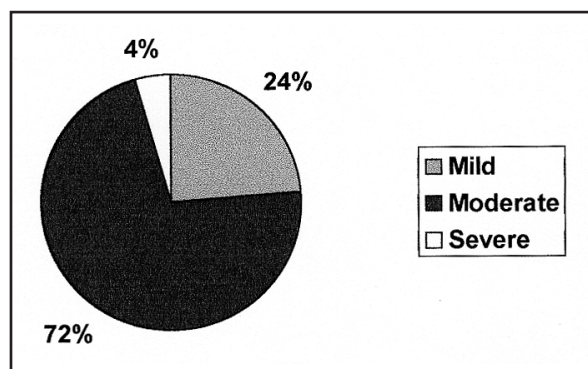


Fig. 2: Severity of Chest X-Ray on Initial Diagnosis of Pulmonary Tuberculosis

Discussion

Incidence Rate

The total number of TB cases and the incidence rate for the year 2001 exhibited an increasing trend when compared to the previous years (1999-1313 cases / 39.9 per 100,000 population). This is worrying and among the reasons postulated for this increase includes ineffective TB programme implementation, rising incidence of HIV/TB co-infection and the influx of foreign workers from countries with high TB incidence.

Ethnic incidence rate analysis reveals the highest TB incidence among Indians who are one of the smaller communities in the state. The contributing factors to this situation could be the relatively low socio-economic status of this community but further research is required to identify the exact reasons for this high TB incidence rate.

The high incidence rate among foreigners has to be interpreted with caution as the total population figures for foreigners is most likely underestimated due to the lack of effective census and the presence of a large population of foreigners who have entered the country illegally. However, it should be noted that Tuberculosis should be considered high on the differential diagnoses in any foreigners presenting with chronic cough.

The reasons for the higher TB incidence rate in males and high gender male to female ratio could be accounted for by the higher mobility of this group due to work requirements. More comprehensive aetiological factors can only be identified through further detailed research.

The trend in age specific incidence rate indicated that the highest risk of infection were the elderly group (> 60 years). This could be explained by reactivation of the primary infection due to lowered body immunity with age or due to pre-existing medical conditions such as Diabetes Mellitus or diseases requiring the use of immunosuppressant drugs such as steroids. In terms of the TB control programme, this finding is useful in implementing active case detection programmes in the community.

TB Cases by Place of Treatment

A substantial proportion (37%) of TB patients in Selangor were treated in government centers, which were "out of the state", such as the Respiratory Medicine Institute and the University Hospital in Kuala Lumpur. Apart from this about 15% of these patients were also treated in private medical centers in the state. This is important for the TB control programme as presently the effectiveness of TB treatment for patients treated in "out of state" government health centers was not evaluated by the state TB control programme. This situation is more acute in the private medical centers as they do not monitor important TB programme indicators such as treatment efficacy, treatment compliance and contact examination. These parameters are closely monitored in government health centres and are important for the effective evaluation of the TB control programme.

Severity of Chest X-Ray on Initial Diagnosis of Pulmonary TB

The majority of pulmonary TB was detected in the moderately advanced stage and this underlines the need for the control programme to look into the various strategies of early case detection such as community health education and active case detection.

Treatment Abandonment Rate

The high treatment abandonment rate was worrying as these patients could be potential sources of TB infection in the community, subject themselves to avoidable morbidity/mortality and also be a source for the establishment of Multi Drug Resistant (MDR) TB in the community. One of the main objectives of the control programme is to establish measures to reduce treatment abandonment rate. These are primarily individualized patient health education, patient motivation to complete treatment and having mechanisms to detect patients who default on medication early so as to activate appropriate measures,

such as home visiting, to get these patients back on treatment promptly. It should be noted that presently, there is no mechanism of effectively monitoring treatment abandonment among TB patients treated at private medical centers.

TB Mortality Rate

The state TB mortality has remained almost constant over the last 3 years (1999-2.5 per 100,000, 2001-2.3 per 100,000 population) ³ and is below the target (< 3 per 100,000 population) set by the Ministry of Health. This might reflect the better socio-economic status of the community in Selangor and the availability of comprehensive health facilities as compared to other states.

An earlier study on TB mortality in one of the districts in Selangor ⁴ showed that the TB mortality was related to late diagnosis of the disease and other co-morbid conditions such as HIV infection and Diabetes Mellitus. In the year 2001, HIV/ TB co-infection accounted for about 51% ³ of the total TB deaths notified in the state. This underlines the importance of coordinating TB and HIV control programme strategies at the ground level.

TB Screening at Prisons and Drug Rehabilitation Centres

The high percentage of TB (11.7%) detected among HIV inmates screened in these institutions highlights the importance of having an effective TB/ HIV control programme at these institutions. Presently, the stated protocol was to screen all new inmates for HIV status and if found to be HIV positive, these inmates will have to be screened for TB through sputum smear screening and chest x-rays. Unfortunately, in Selangor this programme was not implemented fully due to the logistic difficulties in getting these investigations done for these inmates especially chest x-rays in government hospitals. However, the high prevalence of HIV/TB co-infection among those screened indicate that resources must be channeled to these institutions to effectively meet the challenge of TB prevalence among its HIV positive inmates.

Active Case Detection through Sputum Smear Screening in Government Outpatient Clinics

The importance of this laboratory surveillance lies in the objective of identifying pulmonary sputum positive TB cases early thus reducing morbidity and decreasing transmission of the bacilli to the community. The

Ministry of Health has identified that this objective can be achieved by screening at least 2% of all new outpatient attendances to government health clinics.

The achievement for Selangor for the year 2001 was 0.3% screening rate of all new government outpatient attendances and one of the main reasons for this shortfall was the lack of awareness among the medical staff on the importance of this surveillance mechanism. Efforts are underway to address this issue by continuing in-service TB control programme awareness training of all levels of medical staff involved in the control programme.

The positive yield for the active case detection was 5.4%, which was lower than the 10% target set by the Ministry of Health. This needs an evaluation of the quality assurance programme for the sputum smear screening done in these laboratories.

BCG Programme

The BCG programme has achieved almost universal coverage of all newborns in the state. The point of concern is that although with this high coverage, a total of 1021 children had received their effective primary immunization only after the age of 1 year. This could be due to vaccination failure in infancy or failure in coverage at birth. As most of these children were seen a few times during infancy at the child care clinics for other immunization schedules, one way of addressing this issue was to remind the health staff, especially the clinic nurses, to look for the BCG scar at each point of contact of the child with health clinics. If the BCG scar was not visualized by the age of 3 months, then the child should be re-vaccinated.

Conclusion

From this evaluation of the TB control programme in Selangor for the year 2001, the following observations were made:

- a) The need to emphasize the role of early case detection through improving community health education; continued in-service training emphasis on TB among medical staff and an effective laboratory based active case detection through sputum smear screening.
- b) Measures should be in place to ensure that TB patients complete their treatment effectively by

- reducing abandonment rate to the minimum. In this aspect, effective implementation of Directly Observed Treatment (DOT) ⁵ as recommended by the World Health Organization (WHO) would play an important role in achieving this objective.
- c) An effective control programme must be established to address the HIV/ TB co- infection in institutions such as prisons and drug rehabilitation centers ⁶. This will involve close interagency coordination between the Ministry of Home Affairs and Ministry of Health to address the various issues which are peculiar to this situation such as the logistics of TB screening, inmate health education on harm reduction practices and health surveillance after discharge from these institutions.
- d) The surveillance of TB treatment indicators in the private health centres, such as treatment efficacy, treatment abandonment rates and contact tracing should be strengthened to meet the standards set by the national TB control programme⁷.

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References

1. Ministry of Health Malaysia. National TB/ Leprosy Control Programme- Annual Report 2000.
2. Malaysia Statistics Department. Population projection for the year 2001 based on the 1991 Population Census.
3. Selangor State Health Department, Malaysia. State TB Control Programme- Annual Report 1999, 2000 & 2001.
4. B. Venugopalan, P. Rajendra. A Retrospective Study of Death Among Patients Treated for Tuberculosis in the Klang Chest Clinic for the Year, *MJM* 1999; 56: 39-43.
5. WHO Report on the Global Tuberculosis Epidemic 1998. A Crossroads in TB Control.
6. Rudi C, Dermot M, Hernan R, Malgosia G. Tuberculosis in prisons in countries with high prevalence; *BMJ* 2000; 440-42.
7. James N. The implications for TB control of the growth in numbers of private practitioners in developing countries; *Bulletin of the World Health Organization* 2002; 80 (10).