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A SURVEY ON TUBERCULOSIS CASES IN PENANG HOSPITAL: PRELIMINARY FINDINGS

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Tuberculosis (TB) is an infectious communicable disease. Although TB is a treatable disease and powerful drugs are available, TB remains a great public health concern worldwide. The objectives of the survey were to study the socio-demographic background, clinical and laboratory data of TB patients in Penang Hospital, and to determine the patterns and types of drug regimen used in their treatment. A retrospective study of all TB patients registered at the Chest Clinic was conducted between May 2002 to February 2003. Patients were followed-up until completion of their treatment in September 2003. Analysis was carried out on 207 patients who had completed the treatment and it was found that 55.5% were Chinese, 33.8% Malay, 72.9% male, 49.6% smokers and 52.2% secondary educated. In terms of disease and drug data, 83.1% of the patients had pulmonary TB, 11.1% had extra pulmonary TB, 2.4% had TB with HIV and 1.9% had drug resistant TB. 59.4% of the patients were on 2SHRZ/4SHR, 21.7% were on 2HRZE/4HR, 10.1% were on 2HRZ/4HR, 4.8% were on 2SHREZ/4SHR and 1.9% were on 2HRE/4HR. The findings showed that the majority of the patients were Chinese, male and with secondary education. Most of the patients had pulmonary TB and about one third of the patients had diabetes. Commonly used regimen was 2SHRZ/4SHR.

Keywords: *Tuberculosis, Demographic, Clinical, Drug regimen*

INTRODUCTION

Tuberculosis has re-emerged as an important public health concern in all countries in the Western Pacific Region, and according to the current estimate two million people in this region developed TB every year (WHO 2001). Inadequate health system in some countries, influx of new cases due to immigrations from high prevalence countries and epidemic of HIV make TB control difficult (American Thoracic Society 1994; Mendez *et. al* 1997; WHO 2003). Penang, as other areas in developing countries, was affected by the rise of HIV/AIDS cases that represents the highest risk factor for tuberculosis (Jerant *et al.* 2000). This research was conducted in Penang Hospital because of a large tuberculosis caseload and its

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implementation of Directly Observed Therapy Short-course (DOTS). In spite of full implementation of the DOTS programme and availability of TB drugs, the number of TB patients in Penang Hospital steadily increased every year. This preliminary study was done to determine the socio-demographic background, clinical and laboratory tests, and to determine the most common type of TB disease and the treatment regimen that was most commonly used.

METHODS

Study design

This study was conducted using both retrospective and prospective methods. Data were collected from the medical records retrospectively for patients on TB treatment during the period between May 2002 until February 2003, and prospectively for the patients that were still on TB treatment after February 2003 to the end of September 2003. The other part of this study was mainly concerned on cost of tuberculosis treatment. Therefore, patients were followed-up prospectively to determine all costs associated with the treatment.

Study population

All patients (n = 267) above fifteen years of age registered at the Chest Clinic who were confirmed TB cases or were being investigated for TB were included in this study. A total of 60 patients were excluded; 33 patients were transferred out to other health centers, 14 were investigated but were not on TB treatment, 7 patients defaulted treatment and 6 died before completion of therapy. The remaining 207 patients were included in the analysis.

Data collection

Most of the data was collected from medical records. The data collected include demographic information (age, gender, race, status of BCG vaccination, smoking and alcohol), clinical data (symptoms, X-ray examination and results of laboratory investigation which were used either for confirmation of TB disease or for monitoring of TB patients). Data which were not readily available in the medical records (monthly income

and level of education) were obtained either by interviewing the patients personally or by telephone contact.

Definitions

Extra-pulmonary TB is a disease that affects organs other than the lungs. Multi-drug resistant TB (MDR-TB) is the disease in which *Mycobacterium tuberculosis* is resistant at least to isoniazid and rifampicin, while drug resistant TB is the disease when the organism is resistant to one of the essential TB drugs. A defaulter is defined as any patient who interrupts the treatment for at least one month (American Thoracic Society 1994; Mendez *et al.* 1997; The New York City Department of Health 1999; Elsony *et. al.* 2000; WHO 2001). As for anti-TB drug regimens, standard abbreviations are adopted: S = Streptomycin, H = Isoniazide, R = Rifampicin, Z = Pyrazinamide, and E = Ethambutol; and the numbers used, e.g., 2SHRZ/4SHR, refer to "months of treatment".

Statistical analysis

Descriptive statistical procedures were carried out using SPSS for Windows (Version 11) and Microsoft Excel.

RESULTS AND DISCUSSION

The Penang Hospital complies to the World Health Organization (WHO) treatment recommendations and the Malaysia TB Control Programme Guidelines by implementing the DOTS programme. There are countries which obtained support from the World Bank and there are areas where the Ministry of Health implements DOTS without the World Bank support. There are several limitations for countries to implement and expand DOTS. Among the constraints are financial insufficiency, particularly for buying TB drugs; technical limitations and lack of skilled human resources.

What was found in our study is patients attend the chest clinic or the health units nearest to their house to take their medications under the supervision of the clinic nurses. If a patient misses a clinic appointment, a telephone call is made to remind them about the schedule. The clinic staffs perform home visits if the patient still defaults his/her appointment. New TB cases are required to attend the clinic everyday for the first two months (initial phase) and later twice weekly for the next four months

(continuation phase). Drug resistant TB patients are required to attend the clinic daily throughout the period of treatment.

As shown in Table 1, about 70% of the patients were between 15 to 54 years of age and this is consistent with the WHO estimation that TB affects the most economically productive age group (Zwarenstein *et al.* 1998; Iyawoo 2004). The incidence of TB was highest among the Chinese; however, it may be due to the fact that Chinese represented the majority of the population in the state. It is commonly thought that TB is a disease of poor, and this study showed that the majority of working patients had a low monthly income and most of the patients only had a secondary level of education (WHO 2000). According to WHO (2001) report, there are strong association between tuberculosis and poverty, it is found that tuberculosis rate in low-income urban populations in the Philippine is double that of the general urban population. The poorest 20% of the world's population bears the burden of almost one half of the world's tuberculosis cases. Tuberculosis deaths that occur in developing countries are reported to be approximately 99% and 95% of new cases occur in this area of the world.

Table 2 shows the clinical data. Our data show that pulmonary TB was the most common type of TB and patients usually had a cough and an abnormal chest radiograph (Centers for Disease Control and Prevention 2000). Only 2.0% of patients had drug resistant TB. Patients with drug resistant TB were as follows: one patient had MDR-TB (0.5%), two patients were resistant to isoniazid (1.0%) and one was resistant to rifampicin (0.5%). There are several areas where drug resistance is high; for example, under the global project on surveillance for drug resistance found that MDR-TB among new cases in several parts of China ranged from 2.9% to 5.3% (WHO 2001). Further findings showed that resistance to any drug in the Western Pacific Region, which includes Malaysia, ranged from 4.8% to 32.9%. This is something that need to be worried about.

Table 1: Demographic characteristics

Characteristic	Patients (n = 207)	Percentage
Age		
15–54	134	64.7
> 54	73	35.3
median age = 47		
Race		
Malay	70	33.8
Chinese	115	55.5
Indian	20	9.7
Others	2	1.0
Gender		
Male	151	72.9
Female	56	27.1
BCG		
Vaccinated	111	53.6
Non vaccinated	81	39.1
Data not available	15	7.3
Smoking		
Smoker	103	49.8
Non smoker	86	41.5
Data not available	18	8.7
Alcoholic		
Alcoholic	45	21.7
Non alcoholic	144	69.6
Data not available	18	8.7
Working		
Yes	98	47.3
No	109	52.7
Monthly Income		
< RM500	9	4.4
RM500–999	65	31.4
RM1,000–1,499	17	8.2
RM1,500–1,999	3	1.4
≥ RM2,000	4	1.9
No income	109	52.7
Education		
Primary	74	35.7
Secondary	108	52.2
University	7	3.4
None	18	8.7

Approximately one third of the patients had diabetes (28.5%). Drug regimens included streptomycin, isoniazid, rifampicin and pyrazinamide daily for two months in the initial intensive phase; and streptomycin, isoniazid and rifampicin twice weekly for four months in the continuation phase was the most commonly used regimen (59.4%). In terms of laboratory tests, the average number of acid fast bacilli staining test done was 2.2, culture of specimen was 1.05 test and 0.86 test for fasting plasma glucose.

Table 2: Clinical and treatment data

Variables	Frequency	Percentage
Types of disease		
Pulmonary tuberculosis	172	83.1
Extra pulmonary tuberculosis	23	11.1
Tuberculosis and HIV	5	2.4
Drug resistant TB	4	1.9
Pulmonary and extra-pulmonary	3	1.5
TB with diabetes		
With diabetes	59	28.5
Without diabetes	146	70.5
Data not available	2	1.0
Drug regimen*		
2SHRZ/4SHR	123	59.4
2HRZE/4HR	45	21.7
2HRZ/4HR	21	10.2
2SHEZ/4HEZ	2	1.0
2SHREZ/4SHR	10	4.8
2HRE/4HR	4	1.9
Regimen containing ofloxacin	2	1.0

*See text for explanation of drug regimen

Most of the patients were not admitted, except in cases of complicated TB, HIV infection, diabetes or drug resistant problems. However, the average duration of hospitalization stay was five days and this was common for patients who were admitted with advanced TB or TB in combination with other diseases (e.g. HIV infection, diabetes). The mean number of physician follow-up for the patients was approximately one during the period of treatment, while the mean number of follow-up with medical officers was six times.

The mean frequency of the patients' visits to the clinic to take their daily dose (initial phase) and biweekly supply (continuation phase) was

120 times. This was more than that recommended 56 doses in the initial phase and 32 doses in the continuation phase. This was mainly due to drug resistant TB cases (daily dose for 18–24 months) and HIV infection, where treatment can go up to 9 months. Tuberculosis and HIV co-infection cases in some countries are increasing. Although our finding only showed 2.4% of cases, this number is expected to be more with the estimated increase of HIV incidences in Malaysia, and with proper screening and detection procedures.

Since most of the data for this study were collected retrospectively, problems of missing and inconsistency are of our main concern. With a survey method, not much can be said about causality. A nationwide study should be collected to give actual prevalence of TB disease among different ethnic group and to study the pattern of TB management in the country as well as the outcomes of TB treatment. The challenge to the country is to ensure ongoing high-quality DOTS implementation, and to develop and maintain monitoring tools for surveillance of tuberculosis prevalence and mortality, drug resistance and TB/HIV co-infection.

CONCLUSION

The study found that the majority of the patients were Chinese, male, smoker, non alcoholic, vaccinated with BCG, had secondary education and not working. In terms of clinical findings, most of the patients had pulmonary TB and about one third of them had diabetes. The common drug regimen used was the combination of streptomycin, isoniazid, rifampicin and pyrazinamide in the initial phase (two months) and streptomycin, isoniazid, rifampicin in the continuation phase (four months).

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