Characteristics of tuberculosis patients in Yazd province, Islamic Republic of Iran, 1997–99

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خصائص مرضى السل في مقاطعة يزد في إيران 1997-1999

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الخلاصة: حددت الدراسة معدل وقوع السل وبعض الخصائص الديمغرافية لدى 604 من المرضى خلال 3 سنوات (1997-1999) في مقاطعة يزد في إيران. وقد اتضح أن المعدل السنوي الوسطي لوقوع السل 26.8 لكل مئة ألف (22.9 لدى الذكور و31.0 لدى الإناث لكل مئة ألف)، وقد كان أعلى معدل للسل بين من يزيد عمرهم على 50 عاماً (111.1 لكل مئة ألف). و كان العدد السنوي الوسطي لحالات السل الرئوي 75.8٪ وخارج الرئوي 24.2٪، وقد شفي من مرضى السل 66.7٪، فيما نقل 8.4٪ إلى مناطق احتواء مختلفة، وعانى 17.7٪ منهم من فشل المعالجة، ومات 7.1٪ منهم. ومن بين المصابين كان 63.2٪ منهم إيرانيين و36.1٪ من اللاجئين الأفغان. ورغم جهود الوقاية والتشخيص والمعالجة للمرضى وللاجئين فإن السل لايزال يمثّل مشكلة هامة في هذه المقاطعة.

ABSTRACT We determined the incidence of tuberculosis and some demographic characteristics among 604 patients in a 3-year period (1997–99) in Yazd province, Islamic Republic of Iran. The average annual rate of tuberculosis was 26.8 per 100 000 (22.9 in males and 31.0 per 100 000 in females). The highest rate of tuberculosis was in the > 50 years age group (111.1 per 100 000). The average annual proportion of pulmonary and extra-pulmonary tuberculosis cases was 75.8% and 24.2% respectively. On average 66.7% of TB patients were cured, 8.4% transferred to a different catchment area, 17.7% were treatment failures and 7.1% died. Of the total, 63.2% were Iranian, 36.1% Afghan refugees. Despite efforts in prevention, diagnosis and treatment of patients and refugees, tuberculosis is still an important problem in this province.

Caractéristiques des patients tuberculeux dans la province de Yazd (République islamique d'Iran), 1997-1999

RESUME Cette étude a permis de déterminer l'incidence de la tuberculose ainsi que certaines caractéristiques démographiques chez 604 patients sur une période de trois ans (1997-1999) dans la province de Yazd (République islamique d'Iran). L'incidence annuelle moyenne de la tuberculose était de 26,8 pour 100 000 (22,9 chez les hommes et 31,0 chez les femmes). L'incidence la plus élevée se trouvait dans le groupe d'âge des plus de 50 ans (111,1 pour 100 000). La proportion annuelle moyenne de cas de tuberculose pulmonaire et extrapulmonaire était de 75,8 % et 24,2 % respectivement. En moyenne, 66,7 % des patients tuberculeux ont guéri, 8,4 % ont été transférés à un autre secteur, 17,7 % ont connu un échec thérapeutique et 7,1 % sont décédés. Au total, 63,2 % étaient des Iraniens, 36,1 % des réfugiés afghans. Malgré les efforts déployés pour la prévention, le diagnostic et le traitement des patients, la tuberculose demeure un problème important dans cette province.

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Introduction

Tuberculosis (TB) remains a major global public health problem. The World Health Organization (WHO) estimated that in 1997 there were about 8 million new cases of TB and 2 million deaths worldwide; the great majority (95%) of these cases and deaths (98%) were in developing countries [*1,2*]. It was estimated that by 2000, the annual global number of new cases would have increased to over 10 million (163 per 100 000 population), and the annual expected number of deaths to 3.5 million per year (nearly 46 per 100 000 population) [*3,4*]. Today, TB remains common throughout most of the world with one-third of the world's population estimated to be infected with *Mycobacterium tuberculosis*. The incidence of TB has recently started to rise again due to increased migration, a higher rate of direct transmission of *M. tuberculosis* and co infection with HIV [*5*].

In 1999, the highest and lowest rates of TB in provinces of the Islamic Republic of Iran were reported to be 137 per 100 000 and 10 per 100 000 respectively [*6*]. The main goal of this study was to describe the incidence of TB and some demographic characteristics of TB patients over a 3-year period (1997–99) in Yazd province, in the central part of the Islamic Republic of Iran.

Methods

Yazd province covers an area of about 74 214 km^2 and has an estimated population of 750 769 (385 936 males and 364 833 females). The study participants were patients with TB aged 8–65 years who were referred to the Yazd referral hospital during the study period (1997–99).

Samples of sputum, tissue or body fluids were obtained and investigated by Ziehl–Neelsen staining and culture methods. Specimens were transported in broth media (Becton Dickinson, Maryland, USA) and processed on the same day if possible, or if delay was unavoidable, the specimens were stored at 4 °C for not more than 1 night before processing. On arrival at the laboratory, the presence of visible fibrinous clots was noted and Ziehl–Neelsen staining was applied. Cultures were obtained by inoculation into conventional solid Lowenstein–Jensen media (Difco). All inoculated cultures were incubated at 37 °C under 5% CO_2. The culture media were investigated twice a week for the first 3 weeks and thereafter weekly for a total of 6 weeks incubation. All isolates were initially confirmed by Ziehl–Neelsen staining and subsequently identified by standard biochemical tests [*7,8*].

The collected data and results of laboratory tests were analysed by *SPSS*, version 6.

Results

A total of 604 cases of TB were identified during the study period. The overall mean annual rate of TB over the 3-year period was 26.8 per 100 000 population (Table 1).

There were 256 males and 339 females. There was no significant difference in the rate of TB between the sexes ($P > 0.05$); the mean annual rate was 22.9 per 100 000 for males and 31.0 per 100 000 for females. Breakdown of the data by age showed the lowest rate of TB was in the ≤ 10 years age group (7.0 per 100 000) and the highest rate among the > 50 years age group (111.1 per 100 000). Data analysis revealed that those aged > 50 years had a significantly higher rate than those in the younger age groups ($P < 0.05$).

The nationality of the TB patients over the 3-year period showed a high proportion of the group were Afghan refugees

Table 1 **Number of tuberculosis patients and rate per 100 000 population by sex and age**

Variable	Population	1997		1998		1999		Total	Mean annual rate
		No.	Rate	No.	Rate	No.	Rate	No.	
Sex									
Male	385 936	87	22.5	107	27.7	71	18.4	265	22.9
Female	364 833	112	30.7	122	33.4	105	28.8	339	31.0
Age (years)									
≤ 10	171 738	22	12.8	10	5.8	4	2.3	36	7.0
11–19	210 309	18	8.6	25	11.9	20	9.5	63	10.0
20–29	120 355	19	15.8	35	29.1	23	19.1	77	21.3
30–39	94 622	14	14.8	23	24.3	13	13.7	50	17.6
40–49	58 922	25	42.4	21	35.6	16	27.2	62	35.1
> 50	94 823	101	106.5	115	121.3	100	105.5	316	111.1
Total	750 769	199	26.5	229	30.5	176	23.4	604	26.8

(36.1%); 63.2% were Iranian and 0.7% other nationalities (Table 2).

Of the 604 patients, 458 patients had pulmonary TB and 146 extra-pulmonary TB. The mean annual percentage of extra-pulmonary TB cases (24.2%) was much lower than for pulmonary TB cases (75.8%) (Table 2).

Table 2 **Distribution of patients by nationality, type of tuberculosis and treatment outcomes**

Variable	1997 (*n* = 199)		1998 (*n* = 229)		1999 (*n* = 176)		Total (*n* = 604)	Mean annual %
	No.	%	No.	%	No.	%	No.	
Nationality								
Iranian	121	60.8	155	67.7	106	60.2	382	63.2
Afghan (refugee)	75	37.7	73	31.9	70	39.8	218	36.1
Other	3	1.5	1	0.4	–	–	4	0.7
Type of tuberculosis								
Pulmonary	147	73.9	186	81.2	125	71.0	458	75.8
Extra-pulmonary	52	26.1	43	18.8	51	29.0	146	24.2
Outcome								
Cured	132	66.3	149	65.1	122	69.3	403	66.7
Treatment failure	49	24.6	34	14.8	24	13.6	107	17.7
Transferred to different area	3	1.5	40	17.5	8	4.5	51	8.4
Death	15	7.5	6	2.6	22	12.5	43	7.1

n = *total number of TB patients.*

The outcome of TB for this group of patients showed that on average 66.7% of patients were cured, 8.4% transferred to a different catchment area, 17.7% were treatment failures and 7.1% died (Table 2).

Discussion

The technologically under-developed and developing countries carry an enormous share of the world's TB burden. The disease is not uniformly distributed and some countries show a continuing increase in TB infection rates, whereas others show declining infection rates [*9–11*]. In industrialized centres, a rise of TB incidence has been observed, due to increased migration, a higher rate of direct *M. tuberculosis* transmission and the HIV epidemic. TB is a continuing threat to health in all parts the world [*5*].

The present study was carried out to monitor the incidence of TB and some demographic characteristics of TB patients in Yazd province in a 3-year period (1997–99). The average annual rate of TB during the study period was 26.8 per 100 000 population (23 per 100 000 among males and 31 per 100 000 among females). The rate of TB in our study is higher than the rate in some other areas in the world [*6,12–15*]. But, it is nearly equal to the lowest rate for developing countries (25 per 100 000), and one-ninth the highest rate for developing countries (240 per 100 000) [*16*].

Real increases in the numbers of TB patients cured will only occur when the Iranian Ministry of Health and Medical Education is able to either directly treat all cases of TB in Yazd province or at least influence the method of treatment applied in private practice and other health care services, such as university hospitals and military services. If the National TB Control Programme can achieve its target of DOTS [directly observed treatment, short-course] for all, it will have had a real impact on the problem of TB, not only immediately on incidence and mortality rates, but also in the longer term on TB prevalence. In addition, clinical mycobacteriology laboratories play an important role in the control of the spread of TB through the timely detection, isolation, identification and drug susceptibility testing of *M. tuberculosis* [*17*].

Today's worldwide TB epidemic and the movement of a growing number of refugees have made TB control in refugee populations an issue of increasing importance. However, in developing countries TB control in refugee populations remains a largely unmet need. Experience shows that despite difficult field conditions, TB control programmes can be managed successfully in this setting [*18*]. It seems that despite the efforts which have been made in prevention, diagnosis and treatment of patients and refugees, TB is still a problem in this province.

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