A total of 420 records of tuberculous patients among Afghani refugees who attended a tuberculosis centre in Quetta, Pakistan were reviewed. There were 53% males and 47% females with an average age of 29.8 (SD = 16.9) years. The average number of individuals per household was 7.3 (SD = 3.26) and in 28% there was a positive family history of tuberculosis. The most frequent symptoms were fever (92.0%), cough (91.4%), sputum (82.1%), night sweats (75.0%) and 33% had haemoptysis. Ninety-six (22.9%) patients had extrapulmonary tuberculosis, involving bone and spine (12.4%), lymphnodes (8.6%) and genitourinary tract (1.9%). Only 58% of the patients completed the course; 42% were non-compliant out of whom 8% were defaulters and 5.0% were lost. Females were generally more compliant than males (p < 0.05), but the significant sex difference disappeared when age was controlled for (p > 0.05). The distance of domicile from the treatment centre was an important determinant in compliance (p < 0.05). Since non-compliance is a major problem among refugees, strategies to improve the compliance rates should be advocated.

Tuberculosis is a chronic infectious, preventable and curable disease. Its incidence in developing countries is unacceptably high with about 4 to 5 million positive new cases per year. In 1990 it was estimated that there were 8 million new cases of tuberculosis worldwide; 7.9 million (95%) were in developing countries. Tuberculosis is considered to be the largest cause of death from a single pathogen in the world. Among the countries of the Eastern Mediterranean region, Afghanistan is considered in the high prevalence category for tuberculosis, while Pakistan is in the intermediate category.

The problems of tuberculosis control in refugee settlements is well recognized, and these include, limited health facilities, prescription of inadequate drug regimens, shortage of supply of medication, and low compliance rates.

This study describes the clinical and epidemiological characteristics of a group of tuberculous patients who attended the tuberculosis centre of the Saudi Red Crescent Society (SRCS) in Quetta in the north-west region of Pakistan. The study also aims at exploring some of the problems facing the control of tuberculosis in refugee settlements, focusing on default and non-compliance.
Subjects and Methods

In 1981 the Saudi Red Crescent Society (SRCS) established a tuberculosis centre in Quetta, a City in the Baluchistan Region in the North West of Pakistan. The centre serves ten refugee camps with a population of about one million. The distance between the camps and the centre varies from 1-hr to an 8-hour car drive. Two specialist doctors (a male and a female), trained in the management of tuberculous patients, run the centre. They have open access to a nearby hospital laboratory and radiology department. The patients either come to the centre on their own or as referrals from primary health care centres in their camps and occasionally from the hospital. In this study a systematic sample of the medical records of 420 tuberculous patients, who attended the tuberculosis centre, were selected by picking up every third file reviewed during November 1989. This represents one-third of the cases recorded in the centre. Information on the age, sex, family size, clinical and laboratory findings, duration of treatment and patient’s compliance and follow-up was recorded on a predesigned form. As regards compliance, the patient was considered non-compliant if he or she did not complete the course of treatment. A patient was considered a defaulter when he or she failed to keep the medicine collection appointment within 2 weeks of the due date (i.e. a patient who missed a 2-week supply of his medication). A patient who defaulted for more than 3 months was considered to be a lost patient. The data were processed on a micro-computer using a statistical package (SYSTAT). The $\chi^2$ and the Mantel Hanzel $\chi^2$ tests were used to assess the statistical significance of results and a p value of $<$0.05 was considered significant.

Results

Of a total of 420 tuberculous patients who were included in this retrospective study, 222 (53%) were males and 198 (47%) females. Their ages ranged from 1 to 90 years with a mean of 29.8 (SD 16.9) years (Table 1). The family size ranged from 1 to 28 individuals with a mean of 7.3 (SD 3.26) individuals, and 28% of the patients had another member of their family with tuberculosis. Of the 97 children below 12 years, only 29 (27.8%) had BCG vaccination. The diagnosis of pulmonary tuberculosis was based on direct sputum examination for acid-fast bacilli and/or culture of Mycobacterium tuberculosis. If the bacteriological study was negative, patients with a typical clinical and radiological manifestations were presumed to have the disease. The majority of patients presented with the following symptoms: fever (92.0%), cough (91.4%), sputum (82.1%), night sweats (75.0%) and haemoptysis (33.0%). Ninety-six patients (22.9%) had extrapulmonary tuberculosis involving bone and spine in 12.4%, lymph nodes (8.6%), and genitourinary involvement (1.9%), while the majority of patients 324 (77.1%) had pulmonary tuberculosis.

Regarding drug treatment the majority of patients (96.9%) were started on anti-tuberculosis therapy during the initial phase, on the WHO recommended regimens for that particular community (i.e. streptomycin, rifampicin, pyrazinamide, and isoniazid for sputum positive pulmonary tuberculosis; and streptomycin, isoniazid and thiacetazone for sputum negative pulmonary and extrapulmonary cases of tuberculosis). During the continuation phase, the patients were maintained on two drugs: the majority (74.5%) were given rifampicin and isoniazid whilst the others received ethambutol and isoniazid (16.2%). Only 58% of the patients completed 8 months of the course proposed, while 175 patients (42%) did not, including 33 patients (8.0%) who were defaulters. There were 19 lost patients (5%).

Age was found to have no significant effect on compliance, and females were more compliant than males ($p < 0.05$), but when age was controlled for, using the Mantel–Hanzel $\chi^2$ procedure, the significant sex difference in compliance disappeared ($M–H \chi^2 = 4.969$, df = 3, $p > 0.1$). The distribution of compliance status by age and sex is shown in Table 2. Of the 245 compliant patients, 156 were living a short distance from the centre, whereas of the 175 non-compliant patients 81 patients were living at a short distance (30- to 60-min drive) from the centre ($\chi^2 = 12.5 \ p < 0.001$).

**Table 1**

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Male No. (%)</th>
<th>Female No. (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;10</td>
<td>34 (8.1)</td>
<td>25 (6.0)</td>
<td>59 (14.0)</td>
</tr>
<tr>
<td>10–19</td>
<td>23 (5.5)</td>
<td>28 (6.7)</td>
<td>51 (12.1)</td>
</tr>
<tr>
<td>20–29</td>
<td>50 (11.9)</td>
<td>33 (8.0)</td>
<td>83 (19.8)</td>
</tr>
<tr>
<td>30–39</td>
<td>33 (8.0)</td>
<td>49 (11.7)</td>
<td>82 (19.5)</td>
</tr>
<tr>
<td>40–49</td>
<td>30 (7.1)</td>
<td>30 (7.1)</td>
<td>60 (14.3)</td>
</tr>
<tr>
<td>50–59</td>
<td>15 (3.6)</td>
<td>13 (3.1)</td>
<td>28 (6.7)</td>
</tr>
<tr>
<td>60+</td>
<td>20 (4.8)</td>
<td>16 (3.8)</td>
<td>36 (8.6)</td>
</tr>
<tr>
<td>Age not specified</td>
<td>17 (4.0)</td>
<td>4 (1.0)</td>
<td>21 (5.0)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>222 (53.0)</td>
<td>198 (47.0)</td>
<td>420 (100)</td>
</tr>
</tbody>
</table>

Discussion

The control of tuberculosis in refugees poses a challenge to organizations co-ordinating and providing care in settlements which comprise transient and indigent populations. Ensuring regular, prolonged treatment is usually hindered by the limited health facilities, difficult transportation and a high rate of default.

Default rate and non-compliance is a major problem in tuberculosis control and more so in refugee settlements. To our knowledge no previous attempt was made to study compliance among Afghan refugees. In the current study information obtained from patient records has shown that 42% of the patients did not complete the course of treatment. The default rate of 8% is comparable with other studies in a similar
setting. For example, the default rate among
refugees at the Thai-Kampuchean border was
about 8.7% 6 However, a default rate as high as
28% during the maintenance phase has been
reported among Somali refugees although a
defaulter was defined as a patient who missed 1
week’s supply of medication. 7

Previous studies have reported social factors,
administrative decisions to move refugees to
inaccessible locations, and adverse reactions to
treatment as reasons for defaulting or non-
compliance. 5-7

The Afghani refugees are fortunate to have
relatively well developed health facilities with
availability of sufficient anti-tuberculous drugs,
reagents for laboratory tests and other supplies pro-
vided by different aid organizations. Nonetheless,
the non-compliance rate was still high and
certainly not acceptable. Because of poverty and
unfavourable socioeconomic conditions as well as
lack of health education, a black market for the
prescribed anti-tuberculous medications has been
established in Quetta where patients used to sell
these drugs. This concealed non-compliance will
no doubt have its impact on the success of the
control programmes. Therefore, there is an urgent
need for the education and motivation of these
patients. Another important determinant of com-
pliance in this group of patients was distance from
the tuberculosis centre, and therefore outreach
services should be established during the main-
tenance phase. Alternatively, anti-tuberculous
medications should be made available in all the
primary health care centres serving refugees in the
camps. Advocating these important strategies will
require more labour and money.

A tuberculin survey among Afghani refugee
children in 1985 showed a downward trend in the
annual infection rate over the years. 9 Also, a
recent tuberculin survey (1988) revealed a high
percentage of BCG-vaccinated refugee children,
(82%-99%) having BCG scars. 10 While these
observations were encouraging, further problems
should not be overlooked. Thus irregular drug
intake will result in mycobacterium resistance and
interruption of treatment may cause relapse of the
disease.

To improve compliance and to cater for default
and treatment failures, decentralization of the
control programme is an important first step.
Moreover, short courses of therapy, and daily
supervised regiments which were successful in
similar settings, 6,11 should be adopted. Further
studies to explore the problems and possible
improvements in control programmes with a cost-
effective approach are badly needed.

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