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Roya Alavi-Naini
Department of Infectious Diseases and Tropical Medicine, Zahedan University of Medical Sciences, Zahedan, Iran

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The Gender Differences in Tuberculosis in a Highly Endemic Region of Iran

Roya Alavi-Naini, Batool Sharifi-Mood and Malihe Metanat

Tuberculosis is a major cause of preventable disease and death in women. This study was done in Zabol, in the Southeast of Iran which is a highly endemic region of Iran to determine the gender differences in tuberculosis. Two thousand two hundred and eighty four cases of tuberculous patients were identified during 2000-2004 in this region. There were 1375 females and 909 males, with a female: Male ratio of 1.5. The notification cases of sputum positive pulmonary tuberculosis during this period were 726 females and 479 males. Women of reproductive age were the most affected groups. Although the numbers of failure to treatment, relapsed and died patients were higher in women but they were not statistically significant. Tuberculosis still remains a public health issue in this part of Iran, especially in women. Therefore tuberculosis control programs should be gender sensitive.

Key words: Tuberculosis, gender, highly endemic region, Iran

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Department of Infectious Diseases and Tropical Medicine
Research Center for Infectious Diseases and Tropical Medicine,
Zahedan University of Medical Sciences, Zahedan, Iran

INTRODUCTION

Approximately one-third of the world's population is infected with TB. Women of reproductive age are more susceptible to disease once infected with TB than are men of the same age. Over 900 million women, mainly between the ages of 15 and 44 are infected with TB world-wide and TB accounts for 9% of deaths among women of this ages (Anonymous, 2001a). Sistan-Baloochestan, southeast of Iran is the largest province of Iran and also the most underdeveloped part of the country. Zabol is a big city of this province with 400, 000 inhabitants with approximately 70, 000 Afghan people. The center of diseases control of Iran ranks Zabol as the province's most heavily affected city with a notification rate of 135/100, 000 population in 2002. The prevalence of smear-positive cases was recorded 76/100, 000 population at the same time (Khazaei *et al*., 2005). In this investigation we tried to reveal the treatment outcome and several kind of tuberculosis according to gender in this region.

MATERIALS AND METHODS

The study participants were patients who were registered as known cases of tuberculosis during the study period (2000-2004) in Zabol. The diagnosis of our patients was based on clinical manifestations, radiological findings and microscopic examination of diagnostic specimens such as sputum or gastric lavage and pathological findings of other tissues compatible with tuberculosis in the case of extra pulmonary tuberculosis. At the end of treatment, each patient is assigned one of the following treatment outcomes: Cured, relapsed, failure to treatment and died. Relapse was defined as patients who have been declared cured of any form of TB after taking a full course of chemotherapy but they report back with sputum smear-positive. Treatment failure was a previously sputum smear-positive patients who, while on treatment, remained or became again smear-positive five months or later after starting treatment. It is also patients who were initially smear-negative before commencing treatment and became smear-positive after the second month of treatment. The collected data were analyzed according to gender by SPSS, version 11.5.

RESULTS

In a total of 2284 tuberculous patients registered during 2000-2004 from Zabol, 1375 (60.2%) patients were female and 909 (39.8%) were male with a female to male ratio of 1.5.

Sputum positive pulmonary tuberculosis were seen in 726 (60.2%) of women (Table 1) and 479 (39.8%) of men.

Table 1: The number and percentage of three types of tuberculosis according to sex in Zabol, southeast of Iran (2000-2004)

	Sex		
	Male	Female	Total
Type of tuberculosis	No. (%)	No. (%)	No. (%)
Sputum positive pulmonary TB	479 (39.8%)	726 (60.2%)	1205 (100%)
Sputum negative pulmonary TB	221 (40%)	331 (60%)	552 (100%)
Extra pulmonary TB	209 (39.7%)	318 (60.3%)	527 (100%)
Total	909 (39.8%)	1375 (60.2%)	2284 (100%)

Table 2: Treatment outcome of tuberculous patients according to gender in Zabol (2000-2004)

	Sex		
	Male	Female	Total
Treatment outcomes	No. (%)	No. (%)	No. (%)
Cured	837 (39.6%)	1278 (60.4%)	2115 (100%)
Relapsed	29 (37.2%)	49 (62.8%)	78 (100%)
Treatment failure	6 (37.5%)	10 (62.5%)	16 (100%)
Died	37 (49.3%)	38 (50.7%)	75 (100%)
Total	909 (39.8%)	1375 (60.2%)	2284 (100%)

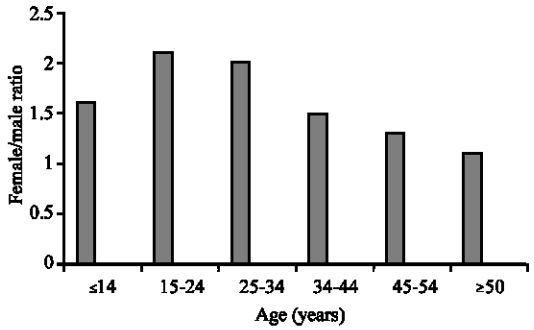

Fig. 1: The distribution of female to male ratio for notification rate of tuberculosis from 2000 to 2004 in Zabol, Iran

The total number and percentage of sputum negative pulmonary tuberculosis and extra-pulmonary tuberculosis were 649 (60.1%) in female and 430 (39.9%) in male. The number of relapse, failure to treatment and death in women were 49 (62.8%), 10 (62.5%) and 38 (50.7%), respectively Table 2. As noted in Fig. 1 women of reproductive age were the most affected groups.

DISCUSSION

The term gender includes features of males and females that are both biologically and socially constructed. Higher tuberculosis notification rates in men may partly indicate differences in exposure, risk of infection and progression from infection to disease (Anonymous, 2005). Recently reported WHO data reveal that the male: Female ratio for case notifications of smear-positive cases in DOTS areas of the WHO regions for all ages range from 1.35:1 in Africa, 1.49:1 in Americas, 2.03:1 in South-East Asia, 2.16:1 in Europe and 1.37:1 in

Eastern Mediterranean (Anonymous, 2004). In a survey in Bangladesh the female/male ratio was 0.33:1 which was not higher than that observed trough routine diagnosis and was not due to lesser accessibility of women to the heath services (Hamid Salim *et al*., 2004). In another study in South India, 57% of females had tuberculosis infection and the prevalence of smear positive tuberculosis was 84/100 000 among females. Therefore women were more likely than men to access health services and be notified under DOTS and adhere to treatment (Balasubramanian *et al*., 2004). In a study in Vietnam, The TB prevalence was similar among men and women and there was a significant under detection of female cases (Thorson *et al*., 2004). In a prospective study of gender and TB outcomes, throughout the Syrian Arab Republic, delay in diagnosis was significantly longer among males. Although in this study, the women reported more barriers to seeking care, compliance with treatment was higher and successful treatment was significantly higher among females than males (Bashour and Mamaree, 2003). In high prevalence countries, however, once infected with TB, women of reproductive age are more susceptible to sickness than men of the same age and they had also a higher case fatality rate (Hamid Salim *et al*., 2004). In our study, 60.2% of the total number of TB during 2000-2004 in the most highly endemic part of Iran was female with a female: male ratio of 1.5. As shown in the figure tuberculosis affects women mainly in their reproductive active years (Fig. 1) and the impression of the disease is also strongly felt by their children. The disease causes a major threat to women's health security. In a cohort study in India, male patients had higher standardized mortality ratios than female, reflecting the likelihood of majority of treatment defaults occurring among men possibly due to risk factors such as smoking and alcoholism (Kolappan *et al*., 2006). TB kills more women than any single cause of maternal mortality. In the study done in Zabol, the numbers of relapsed, failure to treatment and died patients were not significantly higher in women comparing to men ($p>0.05$).

Biological, socioeconomic and cultural factors may cause under-notification in women. The concern and sores associated with tuberculosis have a greater impact on women than on men. Orphans and impoverished families are the results of this horrible disease in the society (Anonymous, 2002). Gender differentiations exist in both reporting and diagnosing TB and passive case finding also leads to failure to diagnose TB, especially in women. Married women may try to hide their symptoms because the stigma associated with TB causes divorce or not getting married. Socioeconomic factors also have an impact on TB control efforts, especially for women who suffer from poverty, low social status and educations. A study in India found that male patients with TB expected their wives to care for them but infected wives rarely received care. Thus, married women may try to hide their symptoms instead of seeking help (Anonymous, 2001b). Women may find it more difficult to complete their treatment once symptoms subside. Thus, TB control programs should be gender sensitive. Despite efforts to control the disease by using DOTS strategy, tuberculosis still remains a public health issue, especially in this part of Iran. But our results revealed that despite all the barriers for under reporting of tuberculosis in women, more than half of the reported patients were female. Beside all mentioned above, may be this fact is due to the improvement of health education programs and case finding in Iran during the recent years.

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