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ORIGINAL ARTICLE

Screening for tuberculosis among patients with chronic psychiatric disorders in Hamedan

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ABSTRACT

Background: Tubercle bacilli most often are transmitted from one person by the airborne route. The aim of the present study was to determine the frequency of latent tuberculosis infection and active pulmonary tuberculosis among patients with chronic psychiatric disorders in Hamedan.

Patients and methods: In a cross sectional study, 215 patients with chronic psychiatric disorders were investigated for tuberculin skin test. Those with an induration of ≥10 mm were introduced for further evaluation, including a chest-x-ray and examination of the sputum for acid-fast bacilli for those with radiographic abnormalities.

Results: Of 215 patients, 62 (28.8%) had positive tuberculin skin test reaction. Age and duration of psychiatric disorders were significantly associated with test positivity. Of 62 tuberculin-positive patients, 25 (40.3%) had radiographic evidences of inactive pulmonary tuberculosis. None of them had positive sputum smear for tuberculosis.

Conclusion: Chronic psychiatric patients are more susceptible to tuberculosis infection. Screening tests should be applied for these patients.

Keywords: *Mental disorders, Screening, Tuberculosis, Tuberculin skin test.*
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INTRODUCTION

Mycobacterium tuberculosis infects one third of the world's population and causes more than 8 million new cases of tuberculosis (TB) and approximately 2 million deaths each year (1). Because of its unique determinants and particular social and geographic distributions, tuberculosis control programs have not yet succeeded in disease elimination. Tubercle bacilli most often are transmitted from one person by the airborne route. Virtually all spreads of M. tuberculosis in a community are caused by patients with pulmonary TB (2,3). The duration of exposure and the degree of ventilation of the ambient environment influence the probability of becoming infected with TB. Thus, intimate household contacts and socioeconomic conditions, that induce crowding and people's close association in poorly ventilated enclosures predispose the spread of tubercle bacilli. Transmission occurs easily in other restricted environments such as nursing homes, prisons, homeless shelters, and hospices (3,4). Since the incidence of TB has increased mainly in high-risk groups, screening efforts should be focused on these groups, and skin testing programs should be

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provided at facilities such as shelters, prisons, and long-term care facilities (5).

Mental illness is also highly prevalent and contributes to problems in the recognition and treatment of TB when it occurs (3). There are scanty reports on tuberculin test screening in psychiatric patients. Studies carried out in certain regions of United States of America have shown positive tuberculin skin test (TST) rates of 17-20.2% in patients with psychiatric disorders, indicating a strong relationship between psychiatric disorders and positive tuberculin tests (6-8).

In the present study, we ascertained the frequency of latent TB infection and active pulmonary TB in residents of two institutions hospitalizing chronic psychiatric patients.

PATIENTS and METHODS

In a cross sectional study, 215 patients with chronic psychiatric disorders institutionalized in long-term care facilities in Hamedan, were included. Tuberculin test was achieved using 5 IU PPD provided by the Pasteur Institute (Tehran, Iran). Skin test reading appointments were made between 48 and 72 hours after planting. The reaction was reported as "positive" if the diameter of induration was equal to or more than 10 mm. Individuals with a positive test were encouraged to seek further medical evaluation, including a chest-x-ray and direct smear examination of the sputum for acid-fast bacilli in those with radiographic changes indicative of TB; this was followed by culture in smear- negative cases.

Moreover, a clinical chart was prepared on which to record the patients' demographic and clinical information according to the medical records of the patients kept by a general practitioner who visit the patients in the institutes at regular intervals. The study protocol was approved by the Committee of Ethical Research of Hamedan University of Medical Sciences.

Data were analyzed using SPSS software (version 11.5, SPSS Inc., USA). Differences in sex distribution were analyzed using chi-square test. The student t-test was used for continuous variables to determine the statistical significance at a 95% confidence level.

RESULTS

The study population included 135 males (62.7%) and 80 females (37.3%) with the mean age (± standard deviation) of 38.9±12.1 years (a range, 18-85 years). The mean duration of mental disease since the onset of symptoms was 10.8±7.8 years (a range, 2-35 years). The mean duration of institutionalization was 5.0±6.2 years (a range, 1-30 years). None of the patients had known underlying disorders including hematologic malignancies, military tuberculosis, influenza, or use of immunosuppressive drugs that might result in false-negative tuberculin test. Meanwhile, none of them had a past-year history of BCG vaccination or documented active TB.

Among 215 chronic psychiatric patients, 62 (28.8%) had positive TST reaction, among whom 51.6% had a 10-14mm and 48.4% had a ≥15mm induration. Among those with negative TST results, 56.8% had a 5-9mm induration and 43.2% did not react at all.

The characteristics of patients with positive or negative TST are shown in table 1. No significant differences were observed in the sex distribution between the two groups. The mean age of patients with positive TST was significantly higher than those with negative test. The positive test group had a longer duration of psychiatric disease, however, there was no significant difference in duration of institutionalization between TST-positive and TST-negative patients.

Of 62 TST positive patients, 25 (40.3%) showed fibrotic changes or calcifications in chest x-ray consistent with prior TB. None of them had

positive sputum smear or culture for acid-fast bacilli.

Table 1. Characteristics of 215 chronic psychiatric patients with positive and negative tuberculin test

Variable	Positive-TST* (n=62)	Negative-TST (n=153)	p-value	95%CI
female/male	24/38	56/97	NS‡	
Age (yrs)	44.7±11.4	36.6±11.7	<0.001	37.27-40.55
Disease duration# (yrs)	13.17±8.34	9.93±7.4	0.006	9.82-11.91
Duration of hospitalization† (yrs)	5.6±6.56	4.84±6.17	NS	4.21-5.9

* Tuberculin skin test, ‡NS: Not significant, # Duration of disease from the onset of symptoms till TST, †Duration of residence in institutions for chronic mental diseases

DISCUSSION

In order to make tuberculosis eradication worldwide, we must recognize and treat TB infection aggressively because most active cases arise from the infected pool. In recent years, the focus of TB screening has changed to target those groups more likely to benefit from treatment of latent TB infection (9,10). Targeted screening helps concentrate resources where they are most needed, upon those people at highest risk for recent infection and/or highest susceptibility for developing disease once infected (11).

Chronic psychiatric patients institutionalized in long-term care facilities are among the potentially high-risk groups. Nevertheless, there are few reports on the prevalence of TB infection in psychiatry patients. In a study in New York, the prevalence of TB infection among 71 patients with severe mental illness had been 17%. None had had active TB (6). Another retrospective study in Massachusetts general hospital, showed 20.2% positive TSTs in 655 patients of a state psychiatric hospital (7). Our report of 28.8% TST positivity is higher than the aforementioned studies.

Although there is no published data regarding the prevalence of latent TB infection in general population in our region, the results of studies on the prevalence of TST positivity in different groups in Iran indicate higher prevalence rates in prisoners (12), drug abusers (13), and hospital employees (14) (50%, 66.7%, and 36.2%, respectively), however, they imply lower prevalence rates (1.6-14.2%) in low-risk groups (15,16).

Moreover, our study indicates that the increase in the age or disease duration may have an important role in acquisition of TB infection. However, since it was a cross sectional study, inferences about cause-and-effect relationships between potential risk factors and the prevalence of TST positivity are limited.

Despite the absence of active pulmonary TB in our series, 30 of the TST positive patients (48.4%) had indurations of ≥15mm and 40.3% of them had radiologic evidences of inactive pulmonary TB. These results suggest that chronic psychiatric patients may be at increased risk for active tuberculosis. The reports of two outbreaks of TB among long-term mental hospital residents highlight our opinion (17,18).

In conclusion, our study confirms the importance of screening for TB infection among individuals with severe and persistent mental illness specially those institutionalized in long-term care facilities.

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