Gender Difference in Clinical Presentation of Turkish Patients with Pulmonary Tuberculosis

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Abstract-. The study was aimed to investigate the diagnostic differences between male and female patients in pulmonary tuberculosis in a tertiary 660 bedded Educational Respiratory Medicine Hospital, Istanbul, Turkey. A retrospective study was conducted with the new diagnosed, 50 men and 50 female pulmonary tuberculous patients. Age, symptoms, personal history, radiologic and sputum smear findings were collected from their files. 44 male and 42 female patients were enrolled to the study. Male patients tended to be older, smoke more, get alcohol more, lose weight more and have sputum smear positivity more than the female patients. Neither the time of diagnosis nor the radiologic appereance differed statistically. The radiologic appereance, not the clinic symptoms help to diagnose tuberclosis in female patients; especially in those with no weight loss and sputum smear negativity.

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Introduction

Tuberculosis is still a serious problem in Turkey and in the world. 1/3 of all world population is infected. 9 million new tuberculosis patients are detected each year and 1.7 million of them die (1). Tuberculin purified protein derivative test (PPD) positivity was detected as 56% (14,971,000 patient) in 1959 and 25% (11,578,000 patient) in 1992 in Turkey (2). WHO suggests the tuberculosis prevalance to be 45/100000 in Turkey (1). Tuberculosis control programme is not completely succesful due to the low bacteriological diagnosis rate.

This study was planned to determine the diagnostic differences due to gender, in pulmonary tuberculosis in our country.

Materials and Methods

A retrospective study was conducted in Süreyyapaşa Chest Diseases Hospital in Istanbul. As it was a retrospective study, data collection did not warrant any formal ethical approval. New diagnosed 50 women, 50 men pulmonary tuberculosis cases in August 2005-September 2005 were randomly enrolled to the study. 6 men, 8 women's many datas were missing so they were drawn out of the study. Ending with 44 men and 42 women pulmonary tuberculosis cases, their files were examined and the following data were collected: Age, socioeconomic status, symptoms (cough more than 3 weeks, sputum, hemoptysis, night sweat, chest pain, fever, weakness, weight loss more than 10% in 1 month, duration of the symptoms), tuberculosis anamnesis, index case in the family, comorbid disease (e.g. Diabetes and chronic lung diseases), smoking status, alcohol intake, BCG scar in physical examination, radiologic findings, sputum acid-resistant bacilli (ARB), bronchial lavage ARB (if available), PPD, sedimantation, albumine. The delay time of diagnosis were also researched. Period of time between: 1. Symptom beginning-first doctor application 2. First doctor application-hospitalisation 3. Hospitalisation- start of antituberculous agents.

Sputum smear positive (PTB+) include: a. Two or more initial sputum smear examinations positive for acid-fast bacilli (AFB), or sputum ARB positivity or b. One sputum smear examination positive for AFB plus radiographic abnormalities consistent with active pulmunary tubeclosis (PTB) as determined by a clinician

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or c. One sputum smear positive for AFB plus sputum culture positive for *M. tuberculosis*. Sputum smear-negative (PTB-negative) pulmonary tuberculosis included the following:a. At least three sputum specimens negative for AFB, and, b. Radiographic abnormalities consistent with active PTB, and c. No response to a course of broad-spectrum TB antibiotics, and d. Decision by a clinician to treat with a full course of antituberculosis chemotherapy (3).

The patient files with the missing datas were excluded from the study.

Statistical analysis

Statistical analysis was performed by Statistical Package for Social Sciences (SPSS)11.5 software (SPSS Inc., Chicago, IL, United States). The mean differences between groups were compared by Student's t-test. Mann-Whitney U-test was used for comparison of median values. Categorical data evaluated by Pearson Chi-square or Fisher's Exact test, where applicable. A *P*-value less than 0.05 was considered as statistically significant.

Results

44 male, 42 female patients were enrolled to the study. The mean age of male patients were 42.9 ± 13.8 (16-68), the mean age of the female patients were 28.95 ± 13.5 (14-64). The male patients were older (*P*<0.001). The male working patients were more than the female working patients (90.9% versus 38.1%, *P*<0.001). The female student patients were more than the male student patients but not statistically significantly. The educational status were similar in both groups (Table 1).

There were no difference in cough, sputum, hemoptysis, night sweat, chest pain and fever. 86.4% of male, 64.3% of the female patients reported >10% of weight loss in one month. The difference was statistically significant (*P*=0.017) (Table 2). The index case of tuberculosis, comorbidity, BCG scar were similar in both groups. 91% of the male and 33% of the female patients were smokers. The difference was statistically significant. (*P*<0.001) (Table 3).

Table 1. Demographic variables.

Variables	Female	Male	*P*-value
Age	29.95 ± 13.5	42.98 ± 13.8	<0.001
Worker	38.1% (16)	90% (40)	<0.001
Without education	14% (6)	4.5% (2)	>0.05

Table 2. Symptoms

Symptoms	Female	Male	Total	*P*-value
Cough	83% (35)	79.5% (35)	81.4% (70)	>0.05
Sputum	64.3% (27)	63.6% (28)	64% (55)	>0.05
Hemoptysis	23.8% (10)	38.6% (17)	31.4% (27)	>0.05
Night sweat	59.5% (25)	70.4% (31)	65% (56)	>0.05
Chest pain	57.1% (24)	45.5% (20)	51% (44)	>0.05
Fever	52.4% (22)	45.5% (20)	48.8% (42)	>0.05
Weight loss	64.3% (27)	86.4% (38)	75.6% (65)	0.017
Fatigue	83% (35)	86.4% (38)	84.9% (73)	>0.05
Anorexia	73.8% (31)	77.3% (34)	75.6% (65)	>0.05

Table 3. Personal history.

	Female	Male	Total	*P*-value
Previous tuberculosis	14.3%	25%	19.8%	>0.05
Index TB case	31%	20.5%	25.6%	>0.05
Diabetes	11.9%	11.4%	11.6%	>0.05
Obstructive lung disease	2.4%	6.8%	4.7%	>0.05
Smoking history	33%	91%	62.8%	<0.001
Alcohol intake	0 (0) %	38.6%	19.8%	<0.001
BCG scar	1.08 ± 0.69	1.15 ± 0.8	1.11 ± 0.74	>0.05
Renal disease	4.5%	0%	2.3%	>0.05
Malignancy	2.3%	2.4%	2.3%	>0.05

In male patients, right upper and middle zone infiltration were slightly more than the female patients (P=0.055). Left lung involvement was slightly more in the female patients. The cavity formation, extrapulmonary tuberculosis were similar. 90.9% of the male patients and 71.4% of the female patients had sputum ARB positivity. The difference was statistically significant (P=0.02). PPD values were slightly higher in male patients. Blood sedimentation, bronchial lavage ARB were similar. PTB-negative disease was seen in 4% of the male patients and 16.7% of the female patients (P=0.06).

Discussion

Differences in tuberculosis rates between men and women may reflect biological differences in the epidemiology of tuberculosis. The studies directly investigating gender difference in tuberculosis are mostly about delays in doctor admissions (due to barriers in accessing health care services, especially in poor countries due to socioeconomic and cultural factors) and behavioral treatment usage (4-9). In our study, there were no significantly difference in delays to diagnosis in either stage: First doctor application, duration of time diagnose in the hospital and the therapy administration time.

There are few studies concentrating on the gender difference in clinical and radiological features of pulmonary tuberculosis (10,11). This study was planned to bring out any speciality due to gender that can have effect on the duration of diagnosis.

In our study, men tended to be older. There are few studies enabling to compare the age of the two sexes; the age of the males were found to be older in two studies (11,12) and similar in one study (10). Our sample size is not enough to conclude in this situation, but may point out a biological difference in the defence system due to gender and age.

In our study, male patients were found to lose more weight than female patients (P=0.017).

There are small metabolic differences between healthy man and woman. On avarage, women's total energy expenditure, which is the number of calories burned for metabolic needs, including breathing, blood circulation, digestion and physical activity is 5 to 10 percent lower than men's (13). Body composition, which is the amount of muscle, bone and fat that make up the body are quite different between men and women. Men in general have more muscle mass, heavier bones and less body fat than women. The recomended percentage of body fat for a woman is between 20 to 30 percent which is thought to be higher for childbearing, while the recomended range for a man is between 12 to 20 percent. Because of these differences, men burn more calories than women at rest (14). Physical activity differences also appear to play a role. Women in general tend to be less active than men. These two factors: more calories burned at rest and more calories burned during activity make it easier for men to eat more without gaining weight. Can these physiological differences cause more weight loss in male patients? In a study with tuberculous lymphadenitis, men were reported to have more weight loss , night sweats and fever (15). Diseases other than tuberculosis like malignancies cause serious weight loss. In some studies, male oncological patients were shown to lose more weight than female patients (16-18), while a study found no difference in weight loss between male and female patients (19).

Male patients may tend to lose more weight than female patients in diseases, including tuberculosis. This theory warrants further investigation.

In our study the smear positivity was more in the male patients than female patients (90% versus 71.4%, P=0.02) inconsistent with the other studies (10,20-23) . There was no difference in diagnosis time between males and the females. The sputum smear negativity did not cause diagnosis delay.

The right lung invovement was slightly more in male patients and left lung involvement was slightly more in females, both not statistically significantly. There was no difference in extent of the lesions between the two gender, the cavity formation did not differ. The comorbid diseases also did not show difference, which can explain the similarity in the radiological extension. There are studies showing more advanced lesions in the male (10,11,24).

Male patients tended to smoke more than females (P<0.001), inconsistent with the other studies (10,11,21). Whether this situation leads to more sputum and more sputum ARB positivity is not certain. A large study from Spain concluded that smokers were more likely to have cavities and positive bacilloscopy (25). In our study, radiologic appereance including cavity did not differ between male and female patients but smear positivity was more in the male patients. A large review concludes that smoking is associated with risk of being infected with *M. tuberculosis*, risk of developing tuberculosis and risk of developing more severe tuberculosis (26).

In our study, male patients were found 1. to be older, 2. to have more smoking history, 3. to have more

alcohol intake, 4. to loose more weight than female patients, 5. to have more smear positivity than female patients. These differences were not found to cause delay in diagnosis. The radiologic appereance should alert clinican to consider "tuberculosis" even in the female patients with no weight loss and sputum smear negativity.

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