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SHORT COMMUNICATION

Gender differences in tuberculosis in Rio de Janeiro, Brazil

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SUMMARY

As the leading infectious killer of youths and adults, tuberculosis (TB) kills more women than all other causes of maternal mortality combined. The aim of this study is to investigate gender differences in the reported cases in Rio de Janeiro from January 1995 to December 1999. There were 18 428 females and 36 830 males, with a female:male ratio of 0.5; 30.8% (5676) of the female cases reported had had previous close contact with a tuberculosis case compared to 23.1% (8510) of the males. Extra-pulmonary tuberculosis occurred in 3966 (21.5%) and 6521 (17.7%) women and men, respectively. Genitourinary tuberculosis had the highest female:male ratio.

KEY WORDS: gender; women; genitourinary; tuberculosis; Brazil

WORLDWIDE, tuberculosis (TB) accounts for nearly 26% of all avoidable deaths, and approximately 80% of these are in the most economically productive age group (15–54 years).[1] As the leading infectious killer of youths and adults, tuberculosis kills more women than all others causes of maternal mortality combined.[1] In recent years, the increased number of cases of acquired immune-deficiency syndrome (AIDS) among women and its known association with TB has added specific concern on this subject.

Old studies of comparative mortality in the two sexes have brought to light the existence of basic differences when both sexes are compared at the various age periods.[1] The notification rates of tuberculosis have been reported to be higher in men than in women in several countries.[2] Some authors have theorized that these differences may reflect distinct TB epidemiology and/or access to health care.[3]

Tuberculosis is an important cause of female morbidity, mainly in the reproductive years. Female genital tuberculosis must be considered, particularly in places with high prevalence of TB. The proportion of genital tuberculosis cannot be exactly determined because most studies related to gender differences do not include data on extra-pulmonary tuberculosis.[4]

In Brazil, particularly in Rio de Janeiro, there are no data to describe the epidemic behavior of tuberculosis in women. The aim of this study is to describe and compare, over 5 years, the notification rates of pulmonary, extra-pulmonary and genitourinary tuberculosis among men and women in Rio de Janeiro City.

STUDY POPULATION AND METHODS

We analyzed cases of TB reported to the Rio de Janeiro TB Surveillance System from 1995 to 1999, which in-cluded both bacteriologically confirmed and clinically but not bacteriologically confirmed cases. The data originated from 35 primary health care units and all hospital (public and private) notifications. The ratio of TB notification rates among women and men was calculated by age group and summarized as age-standardized rate ratios. To allow comparison by age and sex and to facilitate comparisons, age groups were defined as follows: <15, 15–24, 25–34, 35–44, 45–54, 55–64 and $\geqslant 65$ years.

The data were analyzed using Epi Info 2000 software (Centers for Disease Control and Prevention, Atlanta, GA, USA). Stratified analysis and multiple logistic regression assessed characteristics that were related statistically to any variable.

RESULTS

A total of 55 258 tuberculosis cases were reported to the Rio de Janeiro TB Control Program from January 1995 to December 1999. There were 18 428

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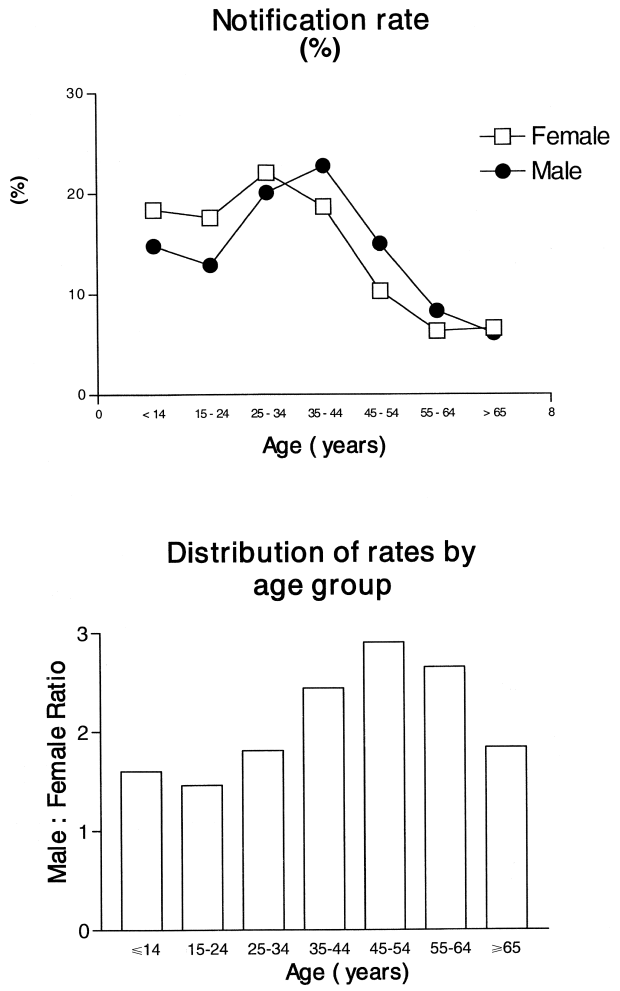

Figure Notification rate of tuberculosis from 1995 to 1999 in Rio de Janeiro, Brazil.

(33.4%) females and 36 830 (66.6%) males, with an exact female:male ratio of 0.5. The mean age for women was 35.9 years and for men it was 39.0. Approximately 31 056 (56.2%) of all cases had only received elementary schooling, with no gender differences. Human immunodeficiency virus (HIV) co-infection was detected in 760 (4.1%) of females and 1896 (5.1%) of males. The notification by sex and age are seen in the Figure.

The tuberculin test was performed in 22% (4094) of women and 16% (5937) of men. The rate of positive tuberculin test (>10 mm) was 58% (2385) for women and 52% (3093) for men. Female cases reported among previous close contacts were 30.8% (5676) compared to 23.1% (8510) for males. Nearly all (96.7%) reported cases underwent chest X-ray. The radiographic pattern was considered typical for tuberculosis in 15 656 (88.3%) women and in 33 067 (92.5%) men. Sputum smear examination was performed in 12 037 (65.3%) women, with 65.7% positive cases, and in 26 283 (72.8%) men, with 67.5% positive cases (Table).

Pulmonary tuberculosis accounted for most cases. Extra-pulmonary tuberculosis occurred in 3966 (21.5%) and 6521 (17.7%) of women and men, respectively. Pleural TB was the most frequent extra-pulmonary form, corresponding to 44.2% of these cases, with the same female:male ratio as for pulmonary TB (0.5). However, for lymph node and ophthalmic tuberculosis cases the female:male ratios were 0.7 and 1.1, respectively. Genitourinary tuberculosis had the highest female:male ratio (1.2). The clinical TB characteristics by sex are seen in the Table.

Table Clinical TB characteristics by sex from 1995 to 1999 in Rio de Janeiro, Brazil

Characteristics	Female *n* (%)	Male *n* (%)	Total	Female:male ratio
HIV	760 (29)	1 896 (71)	2 656	0.4
Case-finding	5 676 (40)	8 510 (60)	14 186	0.7
PPD test				
Performed	4 094 (41)	5 937 (59)	10 031	0.7
Positive (>10 mm)	2 385 (44)	3 093 (56)	5 478	0.8
Baciloscopy				
Performed	12 037 (31)	26 283 (69)	38 320	0.5
Positive	7 905 (31)	17 748 (69)	25 653	0.4
X-ray				
Performed	17 726 (33)	35 759 (67)	53 485	0.5
Typical of TB	15 656 (32)	33 067 (68)	48 723	0.5
Normal	1 360 (46)	1 595 (54)	2 955	0.9
Pulmonary	14 462 (32)	30 309 (68)	44 771	0.5
Extra-pulmonary	3 966 (38)	6 521 (62)	10 487	0.6
Pleural	1 534 (34)	3 017 (66)	4 551	0.5
Lymph node	859 (41)	1 259 (59)	2 118	0.7
Ophthalmic	100 (53)	90 (47)	190	1.1
Genitourinary	231 (55)	189 (45)	420	1.2
Others	1 242 (39)	1 966 (61)	3 208	0.6
Total	18 428	36 830	55 258	

TB = tuberculosis; HIV = human immunodeficiency virus; PPD = purified protein derivative.

DISCUSSION

Our study covers a very large number of cases, allowing us to make some interesting observations. One of the characteristics of the Brazilian TB Control Programme is that TB diagnosis is based on clinical grounds supported by radiographic and bacilloscopic results. Unlike Rieder et al., we show that the number of positive sputum smears among men was not significantly higher than among women.[5] However, the typical radiological pattern of TB was more common in men. Tuberculosis occurs in different ways in men and women. In Madrid 1999, the International Union Against Tuberculosis and Lung Disease (IUATLD) specialists discussed the particularities of the tuberculosis specifically in women.

We observed that female cases among previous contacts with TB cases were more frequent than in males. This observation agrees with that of Cassels et al., who found that in active case finding the percentage of female cases detected rose from 28% to 46% of identified cases.[6] These authors identified a health care access problem to explain the differences in notification rates among the sexes.[4]

Although in our study only TB cases were reported, women with tuberculosis had a higher rate of positive tuberculin tests than men. Several studies have demonstrated that, in countries with a high prevalence of TB, women in the reproductive age have progression rates for disease that are higher than for men in the same age group, and that puerperal women are subject to a more rapid rate of progression than other women.[2] Our observation also supports the idea that disease progression could not be responsible for the lower notification rates among women.

Our data showed that there were differences between the relative age distribution of tuberculosis notification rates in males and females. From puberty to the age of 34 years the relative rate in females rises above that among males. Afterwards, the percentage notification rate among men remains higher until old age, when the two rate curves tend to approach each other.

TB of the female genitourinary tract has been an important cause of infertility in the developing world. The reported prevalence of genital tuberculosis in infertile clinics varies widely, ranging from an incidence of 0.69% in Australia to one of 19% in India.[7] Our work showed that genitourinary tuberculosis has the highest female: male ratio among all forms of tuberculosis.

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RÉSUMÉ

Comme cause infectieuse principale de décès chez les jeunes et les adultes, la tuberculose (TB) tue plus de femmes que toutes les autres causes combinées de mortalité maternelle. L'objectif de cette étude est d'investiguer les différences en matière de sexe dans les cas de tuberculose déclarés à Rio de Janeiro entre janvier 1995 et décembre 1999. Il s'agit de 18.428 femmes et de 36.830 hommes, avec un ratio femmes/hommes de 0,5 ; un contact antérieur étroit avec un cas de tuberculose a été observé chez 30,8% (5.676) des cas chez les femmes et chez 23,1% (8.510) des cas chez les hommes. Une tuberculose extrapulmonaire a été observée chez 3.966 (21,5%) des femmes et chez 6.521 (17,7%) des hommes. Le ratio femmes/hommes est plus élevé dans la tuberculose uro-génitale.

RESUMEN

En tanto que la principal enfermedad infecciosa que causa la muerte de jóvenes y adultos, la tuberculosis mata más mujeres que todas las otras causas de mortalidad materna combinadas. El objetivo de este estudio es investigar las diferencias por sexo en los casos declarados en Río de Janeiro entre enero de 1995 y diciembre de 1999. Se declararon 18.428 mujeres y 36.830 hombres, con coeficiente mujer/hombre de 0,5. En el 30,8% (5.676) de los casos femeninos y en el 23,1% de los casos masculinos, se había constatado la existencia de contactos estrechos con un caso de tuberculosis. Se observó una tuberculosis extrapulmonar en 3.966 mujeres (21,5%) y en 6.521 hombres (17,7%). La tuberculosis génito-urinaria presentaba el coeficiente mujer/hombre más elevado.