Comunicação Breve

A retrospective study of the epidemiological aspects of tuberculosis in the Complexo de Manguinhos, an urban slum area in Rio de Janeiro, Brazil, 2000-2002*,**

Um estudo retrospectivo dos aspectos epidemiológicos da tuberculose na comunidade do Complexo de Manguinhos localizado em área urbana do Rio de Janeiro, Brasil, 2000-2002

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Abstract

To describe some aspects of tuberculosis in a low-income community (the Complexo de Manguinhos, in Rio de Janeiro, Brazil), a retrospective study was carried out. Of the 290 cases reported in the 2000-2002 period, 75.8% were new cases. The annual incidence rates were 157/100,000 (2000), 205/100,000 (2001), and 145/100,000 (2002). Although there was a tendency toward a decrease in the number of cases over the period studied, the difference was not significant, suggesting that tuberculosis continues to be endemic in the area. Therefore, despite the existence of local public health care services, more efficient strategies should be implemented in order to increase the effectiveness of tuberculosis control programs in the area.

Keywords: Tuberculosis/epidemiology; Poverty areas; *Mycobacterium tuberculosis*.

Resumo

Para descrever alguns aspectos da tuberculose em favelas, foi realizado um estudo retrospectivo no Complexo de Manguinhos, Rio de Janeiro (RJ) Brasil. Em um total de 290 casos notificados entre 2000 e 2002, 75,8% eram casos novos. A taxa de incidência foi de 157, 205 e 145/100.000, respectivamente. Embora tenha sido observada tendência de diminuição dos números de casos no período de estudo, esta não foi significante, sugerindo manutenção da endemia. Portanto, embora exista um serviço de saúde no local, estratégias mais eficientes devem ser implantadas para auxiliar o Programa de Controle da tuberculose.

Descritores: Tuberculose/epidemiologia; Áreas de pobreza; *Mycobacterium tuberculosis*.

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Tuberculosis (TB) is as old as mankind. According to recent estimates, one-third of the worldwide population is infected with *Mycobacterium tuberculosis*.[1,2] Despite the fact that its emergence in developed countries is associated with the emergence of the human immunodeficiency virus, the incidence of TB has recently been declining. It is currently a disease that is primarily related to poverty, as evidenced by the fact that 85% of the cases are concentrated in developing countries.[3,4]

In Brazil, the estimated annual incidence of sputum smear-positive pulmonary TB is 62/100,000,[5] and such cases occur most frequently in the city of Rio de Janeiro, where the estimated annual incidence is 99/100,000.[6] However, these data might not reflect the true dimension of the problem, since incidence rates are typically underestimated in impoverished areas. Cases detected in the slum areas are reported to the local public health service, which also serves individuals from labor class settlements as part of the slum population.[7] The aim of the present study was to report the epidemiological aspects of TB in patients living in the Complexo de Manguinhos in order to disclose TB retrospective TB data on this community in the 2000-2002 period.

The city of Rio de Janeiro city is divided into five health-care zones (HZs), and the Complexo de Manguinhos corresponds to HZ 3.1 (Administrative Region X). This area is served by the *Centro Saúde Escola Germano Silval Faria/Escola Nacional de Saúde Pública/Fundação Oswaldo Cruz* (CSEGSF/ENSP/FIOCRUZ, Germano Silval Faria College Health Care Center/National College of Public Health/Oswaldo Cruz Foundation), where most of the Complexo de Manguinhos population seeks medical attention. This neighborhood comprises 12 communities known as Parques or Conjuntos Habitacionais, which are classified as slums, the exceptions being Conjunto Habitacional Provisório 2 and Parque Vila Turismo, which have partial sanitation infrastructure, with treated water and a sewer system, and whose populations present a higher socioeconomic status. These two communities are separated by a football field and a railroad right-of-way. The communities Ex-Combatentes, Parque Oswaldo Cruz, Nelson Mandela, and Samora Machel have typical low-income housing. The poorest and most disorganized community is Mandela de Pedra, built along the banks of the Faria Timbó River. According to the City of Rio de Janeiro Municipal Planning Institute, the Complexo de Manguinhos has 43,347 low-income inhabitants distributed in approximately 8000 houses with an average of 5 inhabitants per dwelling.

This was a retrospective study carried out from January of 2000 to December of 2002. The number of reported cases was obtained from CSEGSF medical records and from data collected through the local Tuberculosis Control Program (TCP), which is affiliated with the CSEGSF. All TB patients who were residents of the Complexo de Manguinhos and were treated/diagnosed at the CSEGSF were included. The Excel 7.0 computer program was used for the management, tabulation, and analysis of data. The chi-square test was used in order to assess differences between years and among communities.

From January of 2000 to December of 2002, a total of 290 TB cases, all in residents of Complexo de Manguinhos communities, were treated at the CSEGSF. Analyzing case distribution among these communities, we observed significant differences in 2000 and 2001 but not in 2002 (2000: $\chi^2 = 22.78$, $p = 0.018$; 2001: $\chi^2 = 20.01$, $p = 0.045$, and 2002: $\chi^2 = 10.48$, $p = 0.487$). In 2000, the highest numbers of cases were reported in the communities Conjunto Habitacional Provisório 2 (pop. 8655), Samora Machel (pop. 2232), and Mandela de Pedra (pop. 2477), whereas, in 2001, Parque Carlos Chagas (pop. 2828) had the highest number of cases, followed by Samora Machel and Mandela de Pedra. In 2002, Samora Machel was at the top of this list, followed by Ex-Combatentes (pop. 934), the difference between them not being statistically significant. Although Ex-Combatentes is one of the smaller communities in the Complexo de Manguinhos and possesses a good sanitation infrastructure, the number of TB cases increased from 0 in 2000, to 1 in 2001, and 3 in 2002. However, in the smallest slum, Conjunto Agrícula de Higienópolis (pop. 195), no cases were reported during the study period. In most of the communities studied, the number of reported cases increased in 2001. In three of the high population density communities (Parque Oswaldo Cruz, pop. 5145; Parque João Goulart, pop. 4719; and Nelson Mandela, pop. 4448), the 2002 incidence rate was high in relation to that of 2000 (Figure 1). The mean incidence rate obtained in the study period was >100/100,000 in most of the communities. Samora Machel, Mandela de Pedra, Parque Carlos Chagas and Conjunto Habitacional Provisório 2 had

the highest mean rates. In 2001, Mandela de Pedra presented the highest incidence rate, registering 601 cases/100,000 inhabitants (Figure 1).

Table 1 summarizes the clinical and demographic characteristics of all cases of TB reported in the Complexo de Manguinhos during the study period. Although the proportions of new cases decreased slightly, the number of new cases was higher in 2001. The annual incidence rates for 2000, 2001, and 2002, respectively, were 157/100,000, 205/100,000 and 145/100,000. No statistically significant difference was found among the years (χ^2 = 1.407, p = 0.495). Over 50% of the patients were in the productive age group (18-39 years). Although males predominated (p = 0.01), the number of female patients increased from 37.2% in 2000 to 41% in 2002. However, this difference was not statistically significant. The proportions of patients under 18 or over 60 years of age were both less then 7%. The percentage of cases presenting concomitant infection with HIV was 3-times higher in 2001 than in 2000, dropping back to 1.7-times higher in 2002. Over the course of the study period, the percentage of patients requiring re-treatment increased from 20.9% to 28.4%. The percentage of cure increased from 55.8% to 62.5%, and treatment noncompliance decreased from 30.2% to 19.3%. The proportion of cases in which the diagnosis was altered increased from 1.2% to 5.7%, and the mortality rate increased from 3.5% in 2000 to 6.9% in 2001. Nevertheless, according to the statistical analysis, there were no significant differences among the years, except for the number of patients with smear-positive pulmonary TB, which peaked in 2001 (χ^2 = 10.88, p = 0.004). Although the proportion of cases of extrapulmonary TB increased from 2000 to 2002 (from 11.6% to 14.8%), the difference was not significant.

The epidemiological profile of the TB situation in the Complexo de Manguinhos makes us think more carefully about the disproportional distribution of TB in Brazil. Whereas TB incidence is low in certain regions, it is high in southeastern Brazil, and, in poor communities, the dynamic of TB epidemiology can change over the years in accordance with health and social problems.[8] In the first retrospective epidemiological study carried out in the Complexo de Manguinhos (1986-1994),[9] the communities Conjunto Habitacional Provisório 2 and Parque Carlos Chagas were found to present the highest prevalence. In the present study, the incidence in these communities, although still high, was lower then that found in the earlier study, and other communities emerged with similar or higher rates.

Despite the fact that the local public health care service has included a TCP since 1980, the mean incidence rate in the Complexo de Manguinhos has held steady at >100/100.000 over the years. In most of the communities evaluated in the present study, the number of new cases reported in 2001 was higher than in previous years, although the diffe-

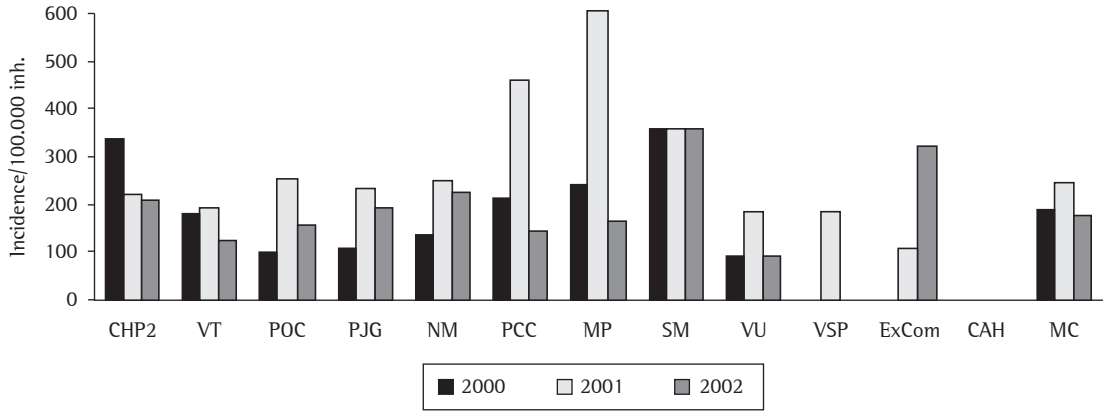

Figure 1 - Annual incidence rate of tuberculosis in the slum-communities of the Complexo de Manguinhos (MC), Rio de Janeiro city, Brazil, 2000-2002. Conjunto Habitacional Programado 2 (CHP2), Vila Turismo (VT), Parque Oswaldo Cruz (POC), Parque João Goulart (PJG), Nelson Mandela (NM), Parque Carlos Chagas (PCC), Mandela de Pedra (MP), Samora Machel (SM), Vila União (VU), Vila São Pedro (VSP), Ex-combatentes (ExCom), Conj. Agr. Higienópolis (CAH).

Table 1 - Distribution of the notified cases in the Complex de Manguinhos, Rio de Janeiro, Brazil, 2000-2002, according with clinical and demographic characteristics.

Variables	Number of patients (%)		
	2000	2001	2002
All cases	86 (100)	116 (100)	88 (100)
Total of new cases	68 (79.1)	89 (76.7)	63 (71.5)
Gender			
Male	54 (62.8)	71 (61.2)	52 (59)
Female	32 (37.2)	45 (38.8)	36 (41)
Age (years)			
11-17	6 (6.9)	4 (3.4)	3 (3.4)
18-39	52 (60.6)	64 (55.2)	45 (51.2)
40-59	26 (30.2)	43 (37.1)	37 (42)
≥60	2 (2.3)	5 (4.3)	3 (3.4)
Clinical Forms			
TB/HIV co-infection	7 (8.1)	20 (17.2)	12 (13.6)
AFB-positive pulmonary TB	46 (53.4)	67 (57.8)	31 (35.2
AFB-negative pulmonary TB	30 (34.6)	42 (36.2)	44 (50)
Extrapulmonary TB	10 (11.6)	7 (6)	13 (14.8)
Re-treatment	18 (20.9)	27 (23.2)	25 (28.4)
Reason for discontinuing treatment			
Cure	48 (55.8	55 (45.4)	55 (62.5)
Noncompliance	26 (30.2)	34 (29.3)	17 (19.3)
Death	3 (3.5)	8 (6.9)	5 (5.7)
Change in diagnosis	1 (1.2)	6 (5.1)	5 (5.7)
Transfer	6 (7)	11 (9.5)	3 (3.4)
Treatment failure	2 (2.3)	1 (0.9)	3 (3.4)
Unknown	-	1 (0.9)	-
Incidence (new cases)[a]	157	205	145
Mortality rate[a]	7	18	11

Source: Tuberculosis Control Program of the CSEGSF/ENSP/FIOCRUZ; AFB: Acid fast bacilli smear; TB: tuberculosis; HIV: Human Immunodeficiency Virus; and [a]/100.000.

rence was not statistically significant. In Mandela de Pedra, the most recently established Complexo de Manguinhos slum and one of the poorest ones, without any sanitation or urban infrastructure, the 2001 incidence rate was 601/100,000 (Figure 1). The atypical nature of the data collected for 2001 can be explained by the fact that the CSEGSF/ENSP/FIOCRUZ TCP was strengthened and reorganized in that year, returning to its various activities, including household monitoring by health agents. Prior to 2001, the TCP was decommissioned due to the violence related to organize crime in the region. In 2001, the Family Health Program was also implemented in Mandela de Pedra, which might have been responsible for the drop in the incidence rate seen in the following year (to 161/100,00). In 2002, the incidence rate decreased in all of the communities studied, except for Samora Machel and Ex-Combatentes, despite the fact that these are two of the more organized communities. In the former, the number of new cases remained constant (8 cases/year), whereas, in the latter, the number of new cases increased from 0 in 2000 to 3 in 2002. All of the small communities followed the TB epidemiological patterns seen in the larger communities, suggesting that the TCP needs to be strengthened in order to improve public health in the area.

In the Complexo de Manguinhos, noncompliance with treatment remained quite high in 2002 (19.3%), well above the 5% standard set by the national Health Ministry.[10] Although the frequency of TB/HIV co-infection in 2001 was lower in the

Complexo de Manguinhos than that seen in the state of Rio de Janeiro as a whole (17.2 *vs.* 26%),[10] the number of new cases in the Complexo de Manguinhos was 3 times higher in 2001 than in 2000.[10] This could be related to a failure of the TCP in the community, since the number of cases in which treatment was discontinued due to a change in the diagnosis was 4 times higher than the city-wide rate.[10] Coincidently, at that time, a resistance survey project was running, which in itself increased diagnostic accuracy in the area.

In places such as the Complexo de Manguinhos, where population density is high, socioeconomic status is low, and organized crime is active, TB control is difficult. Although there was a tendency toward a decrease in the number of new cases over the years, the difference was not significant, suggesting that tuberculosis continues to be endemic in the area. Reflection about the strategies adopted should lead to the development of measures that will improve the performance of TCPs in such high-risk populations and thereby effect changes in TB epidemiology in the near future.

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