

Health team training and active community surveillance: strategies for the detection of TB cases*

Treinamento da equipe de saúde e busca ativa na comunidade: estratégias para a detecção de casos de TB

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Abstract

Objective: To evaluate the impact that Family Health Program (FHP) team training and active surveillance have on the detection of TB cases in a low-income community in the city of Fortaleza, Brazil. **Methods:** The study was performed in an area with approximately 25,000 inhabitants, served by a health care center with five FHP teams, in the city of Fortaleza, Brazil. Although all of the teams were trained, active surveillance was carried out only in one of the areas (area 5). We compared the number of TB cases detected in each of the five areas prior to and after the intervention. We also compared the number of TB cases detected in area 5 to the number of those detected in the other areas, as well as to the citywide number of reported TB cases in Fortaleza, within the same period. **Results:** The number of TB cases detected in the area studied increased from 1 in 2002 to 22 in 2004 ($p < 0.05$). There was no significant difference between the number of TB cases in area 5 and that observed for each of the other four areas ($p > 0.05$). There was a significant increase in the number of TB cases detected in the area studied when compared to the city as a whole ($p < 0.05$). **Conclusions:** Training and sensitization of FHP professionals were effective in promoting an increase in the number of TB cases detected in a low-income community.

Keywords: Tuberculosis; Communicable disease control; Family health program; Epidemiologic surveillance.

Resumo

Objetivo: Avaliar o impacto do treinamento da equipe do Programa Saúde da Família (PSF) e da busca ativa domiciliar na detecção de casos de TB em uma comunidade de baixa renda de Fortaleza. **Métodos:** Intervenção realizada na área de abrangência de um centro de saúde de Fortaleza, Ceará, com cinco equipes do PSF, responsáveis por cerca de 25.000 pessoas. Treinaram-se todas as equipes de saúde do centro de saúde e implantou-se a busca ativa domiciliar apenas na área de abrangência da Equipe 5. Comparou-se o número de casos detectados em cada uma das cinco áreas antes e depois da intervenção, bem como os casos na área 5 com os das outras áreas e com os casos notificados no município de Fortaleza durante o mesmo período. **Resultados:** Observou-se um aumento no número de casos de TB detectados na área do estudo: de 1 caso em 2002 para 22 em 2004 ($p < 0,005$), sem diferença entre a área em que foi feita a busca domiciliar e as outras quatro ($p > 0,05$). Houve um aumento significativo no número de casos detectados na área do estudo em comparação com aquele no município como um todo ($p < 0,05$). **Conclusões:** O treinamento e a sensibilização da equipe de saúde da família foram capazes de promover um aumento na detecção de casos de TB em uma comunidade de baixa renda.

Descritores: Tuberculose; Controle de doenças transmissíveis; Programa saúde da família; Vigilância epidemiológica.

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Introduction

The World Health Organization estimated that, in 2006, the number of new TB cases (in all forms) in Brazil was 94,000, with an incidence of 50 cases per 100,000 population. For the same year, the estimated incidence of pulmonary TB with positive sputum smear microscopy in Brazil was 31 cases per 100,000 population. In addition, the estimated mortality was 4 deaths per 100,000 population. Therefore, Brazil remains among the 22 countries with the heaviest TB burden, being heavier in Brazil than in any other Latin American country. Between 1995 and 2006, the number of reported cases in Brazil was, on average, 63% of the estimated value (ranging from 59% in 2001 to 70% in 2004 and 2005). In the 2005 cohort, the cure rate was 77% for patients under supervised treatment.⁽¹⁾

Each individual with active pulmonary TB infects, on average, 10 to 15 people each year, and 5-10% of the infected people will eventually develop active TB, unless they develop AIDS, in which case 5-10% will develop active TB every year.⁽²⁾ It is estimated that 1% of the general population presents respiratory symptoms and that, of that 1%, 5% is infected with TB. The control of TB is based on the detection and cure of patients with infectious pulmonary TB. Detecting 70% and curing 85% new pulmonary TB cases with acid-fast bacilli present in sputum are included in the World Health Organization recommendations and are aims of the Brazilian National Tuberculosis Control Program.^(3,4)

Early detection of cases is a fundamental strategy for TB control.^(5,6) The ideal places to look for cases are public and private health care facilities. In these institutions—health care facilities, health centers, outpatient clinics and hospitals—conducting active surveillance of patients with respiratory symptoms should be a permanent routine incorporated into the activities of all members of the health care teams.⁽⁷⁾ In the areas in which there are periodic home visits by the health agent, active surveillance should include the detection of TB cases among individuals with respiratory symptoms and people who have been in contact with these individuals, principally infectious cases and children.⁽⁸⁾

In the city of Fortaleza, Brazil, there has been a decline in the number of cases reported to the Municipal Department of Health.⁽⁹⁾ In 2002, 1,917 TB cases were diagnosed, compared

with 2,061 in 2003 and 1,595 in 2004. Of these, 1,698, 1,800 and 1,373, respectively, were cases of pulmonary TB, 41%, 37.1% and 43.5%, respectively, presenting positive sputum smear microscopy. Among the reasons for this decline, underreporting⁽⁹⁾ and a possible reduction in the detection of cases are cited.

This study aimed to evaluate the impact that training Family Health Program (FHP) teams and active surveillance have on the detection of TB cases in a low-income community in Fortaleza.

Methods

We conducted a community intervention in a low-income area in the city of Fortaleza. In 2003, the estimated population of Fortaleza was 2,256,233 inhabitants and there were 92 outpatient health care clinics. We selected the geographic region served by the *Centro de Saúde César Cals de Oliveira* (CSCCO, César Cals de Oliveira Health Care Center), which is divided into five areas, numbered from 1 to 5 and served by five FHP teams. These teams were submitted to training and sensitization for the detection of patients with respiratory symptoms and of cases of pulmonary TB. In this region, we selected area 5, which had an estimated population of 4,500 inhabitants and 1,303 registered houses, in order to carry out active surveillance of patients with respiratory symptoms. Between January of 2002 and June of 2003, prior to the training of the CSCCO professionals, there were 10 cases of diagnosed TB in the five FHP areas: 1 case in 2002 and 9 cases in the first semester of 2003. Of those 10 cases, 1 was a case of extrapulmonary TB and 9 were cases of pulmonary TB. Of those 9 cases, 4 presented positive sputum smear microscopy (1 case in area 1; 2 in area 2; and 1 in area 4). None of the 10 cases occurred in individuals registered as residents of area 5.

The strategies used were as follows:

- 1) The internal routines for the treatment of the patient were reviewed: registration of suspicious cases; receiving, storing and sending sputum samples collected; and completion of compulsory disease reports, as well as of those related to external referrals for complimentary tests and to transport of clinical samples to the central laboratory of the city.

- 2) Physicians and nursing professionals working on the five FHP teams of the CSCCO underwent training (administered by professors of the Federal University of Ceará and by technicians of the Municipal Health Department), containing information on the magnitude, transmission, diagnosis, treatment and control of TB, as well as on strategies for epidemiological TB surveillance
- 3) Mid- and basic-level professionals working on the five FHP teams of the CSCCO also underwent training (administered by the same team, and addressing the same themes as the training given to physicians and nurses), emphasizing epidemiological data and the importance of treatment adherence. The community health agents (CHAs) of area 5 of the FHP, as well as medical, nursing and dentistry students, composing the Academic Project of Health Integration, were also trained in active surveillance strategy. Active surveillance was conducted in only one FHP area of the CSCCO (area 5).
- 4) Home visits were conducted only after the head of the household had given written informed consent. We obtained information regarding cough with expectoration for 3 or more weeks, fever, weight loss, history of TB or contact with a TB patient, as well as demographic data of the residents. Residents classified as presenting respiratory symptoms were advised to seek treatment and conduct sputum testing at the CSCCO. Home visits were conducted between July of 2003 and June of 2004.
- 5) Follow-up meetings and evaluation between the FHP team and field researchers of area 5 of the FHP were conducted every fifteen days at the CSCCO.

We considered entitled to home visits all of those residences located in the area 5 of the FHP having one or more residents, even if a business was being run at that address. We defined a family as a group of people living in the same residence. Those who lived on top or at the back of the residence, with a family dynamic independent from the neighbors were considered components of different families. An individual presenting cough with expectoration for 3 or more weeks was classified as presenting respiratory symptoms. We defined a TB case as an individual in whom the diagnosis had been confirmed by sputum smear microscopy or culture and by a physician, based on the clinical and epidemiological data and on the results of complementary tests.⁽³⁾

Data were entered into a database created for this purpose and analyzed using the Epi Info statistical program, version 6.04. The chi-square test and OR were used in order to measure differences between the number of cases detected in the study area prior to and after the intervention, as well as to determine whether there was a difference between area 5 of the FHP and the other areas and whether there were differences between Fortaleza as a whole and the area in which the intervention was implemented.

This study was carried out in accordance with the standards established by the Declaration of Helsinki and by Brazilian National Health Council Resolution 196/96. The study design was approved by the Research Ethics Committee of the Federal University of Ceará.

Results

Of the 1,303 residences registered in area 5 of the FHP, 72 (5.5%) were commercial locations without residents, 42 (3.7%) were not located, 68 (5.2%), had no residents during the period

Table 1 - Symptoms and history of the residents in general and those with respiratory symptoms living in area 5 of the César Cals de Oliveira Health Care Center, Fortaleza Brazil, 2003-2004.

Symptoms and history	Population in general		Individuals with respiratory symptoms		
	n	%	n	%	% of the general population
Cough	337	7.8	227	100.0	67.4
Sputum	304	7.1	227	100.0	74.7
Fever	106	2.5	56	24.7	52.8
Night sweats	182	4.2	49	21.6	26.9
Weight loss	155	3.6	58	25.6	37.4
History of TB	38	0.9	7	3.1	18.4
Contact with TB	145	3.4	26	11.5	17.9

Table 2 - Positive sputum smear microscopy of individuals presenting respiratory symptoms who were submitted to the test per area of residence in the region served by the César Cals de Oliveira Health Care Center, Fortaleza (CE), 2003-2004.

Area	Individuals with respiratory symptoms tested, n	Positive sputum smear microscopies	
		n	%
1	15	2	13.3
2	33	1	3.0
3	26	2	7.7
4	33	2	6.1
5	50	4	8.0
Total	127	11	8.7

in which the interviews were conducted, and 1,121 (86%) were inhabited residences, considered households. The families in 1,073 (95.7%) of those 1,121 households were visited and interviewed. The families in 41 (3.7%) of the households were not interviewed because the residents were absent at the time of the visits. In 7 households (0.6%), the family declined to participate in the interview. The families visited accounted for 4,293 residents.

The number of residents in each household ranged from 1 to 14, a median of 4 and 2,225 (51.8%) being females.

There were 180 families that reported having at least 1 resident with respiratory symptoms, the total being 227, of which 125 (55.1%) were male and 102 (44.9%) were female ($p = 0.428$). In relation to the study population, the residents presenting respiratory symptoms accounted for 5.3%, with no difference in the distribution by age bracket.

Regarding the other symptoms addressed in the interview, all were more common in those with respiratory symptoms than in those without

Table 3 - Cases of TB per area served by the Family Health Program prior to and after the initiation of the surveillance of cases in area 5 of the community, César Cals de Oliveira Health Care Center, Fortaleza, Brazil, 2002-2004.

Area	2002	2003	2004	Total
1	1	4	5	10
2		6	4	10
3		2	3	5
4		2	5	7
5		1	5	6
Total	1	15	22	38

($p < 0.001$). A history of TB and of contact with a TB patient was also more common among those with respiratory symptoms (Table 1).

We registered sputum smear microscopy results of 50 residents with respiratory symptoms in area 5 (22.0%), with 4 positive results (8.0%; Table 2).

The comparison between the total number of cases diagnosed in Fortaleza in each year (1,917 in 2002, 2,061 in 2003 and 2,064 in 2004) and the total diagnosed in the area served by the CSCCO showed that there was a significant increase in relation to the year prior to that in which the training of CSCCO professionals occurred ($p < 0.05$). There was no significant difference between area 5 of the FHP, where active surveillance was conducted, and the other four areas in which the professionals had undergone training ($p > 0.05$; Table 3).

Between July of 2003 and December of 2004, the period following the beginning of the study, 28 TB cases were diagnosed (2 cases of the extrapulmonary form and 26 of the pulmonary form), of which 19 presented positive sputum smear microscopy (5 in area 1; 3 in area 2; 5 in area 3; 4 in area 4; and 2 in area 5). In 2002, the year prior to the training, 1 case was diagnosed in these five FHP areas, whereas in the year following the intervention, 22 cases were diagnosed (Table 3). The mean result of positive sputum smear microscopy in Fortaleza was 44.7%, whereas in cases detected in the studied regions, it was 73.1%.

Discussion

The proportion of individuals with respiratory symptoms detected in the population was as expected (5.3%). Considering the five areas served by the FHP teams, the number of TB cases detected after the CHA training increased by 180% in relation to that detected prior to the training. This increase cannot be attributed to the citywide TB increase in Fortaleza, since the numbers published by the Municipal Health Department did not show an increase. This observation suggests that the most important factor for the increase in the detection of cases was team training.

We considered as limitations to the study the extra activities that the CHAs carried out in this period, which meant a work overload, prolonging the time of the study. The number of CHAs in the

five areas was lower than that predicted: 4 CHAs in area 5, whereas there should have been 5. The meetings every fifteen days with the CHAs of area 5 of the FHP might have encouraged the CHAs of the other four areas to conduct the active surveillance, even without recording it, therefore contributing to the reduction of the difference between area 5 of the FHP and the other 4 areas. Sputum smear microscopy results were recorded for only 22% of the individuals presenting respiratory symptoms, which might have contributed to the 8% positivity, whereas only 5% was expected, since it is possible that only the individuals with respiratory symptoms that were more severe would have sought treatment. Although the health care facility area is defined, people with TB can be treated and monitored in other health care facilities in the city of Fortaleza. This might have reduced the reporting of cases diagnosed in the area served by the CSCCO.

The layperson does not generally associate cough and expectoration with TB and therefore rarely seeks treatment at a health care facility at symptom onset. Therefore, waiting for patients with respiratory complaints to seek health care is insufficient to break the chain of TB transmission.⁽¹⁰⁾ This is possibly one of the reasons for the low proportion of individuals with respiratory symptoms who were submitted to sputum smear microscopy. Nevertheless, the surveillance of patients with respiratory symptoms in the community, as part of the activities of basic care, is a procedure that is not as simple as it seems and depends on the infrastructure of the health care facility, on professional training and on supervision of continued stimuli, as well as on the priority that should be given to patient treatment and to the performance of sputum smear microscopy.⁽¹¹⁻¹³⁾ In addition, other individual and social vulnerabilities of the patients should be considered, such as lack of fixed income, transportation difficulties and, for those who live in areas where there is more violence, the territorial barriers created by gangs and police interventions.⁽¹⁴⁾ In a study involving active surveillance in a facility treating substance dependence showed that 33% of patients with respiratory symptoms were not submitted to sputum sample collection.⁽¹⁵⁾ In order to promote sputum smear microscopy, the CHA could leave the collection flask in the residence of the indi-

vidual with respiratory symptoms at the time of their detection and take it to the CSCCO within a few days thereafter. Nurses could also visit the homes of these patients who have not yet supplied the material for the exam. The inclusion of radiological investigation could also have increased sensitivity for TB detection.⁽¹⁶⁾ The limitations imposed of the number of radiological tests performed via the Brazilian Unified Health Care System made it impossible for patients with respiratory symptoms to have regular access to these tests.

Training and sensitization of the FHP team were able to promote an increase in the detection of TB cases in a low-income community, suggesting that, in the places where the FHP is implemented, maintaining the team trained, updated and motivated for the early detection and follow-up of cases can greatly contribute to the control of the disease.

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