

Tuberculin Reactivity in United States and Foreign-Born Latinos: Results of a Community-Based Screening Program

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Abstract: Because of the concern that we were underestimating the prevalence of tuberculosis within the Latino community in San Francisco, we undertook a community-based screening program directed largely towards recent immigrants. Of 1,871 intermediate-strength (5 TU) tuberculin tests applied and read, 37 per cent of the reactions were ≥ 10 mm. Significant reactions were found in 53 per cent of foreign-born persons compared to 7 per cent of those born in the United States. Persons older than 20 years of age were more likely to have significant reactions compared to younger Latinos.

Among the foreign-born, the frequency of significant reactions was not influenced by the length of stay in the US or a history of BCG (bacille Calmette-Guérain) vaccination. Two foreign-born children were found to have current tuberculosis. The prevalence of tuberculin reactors among US-born Latino children was 3 per cent, which suggests that undetected transmission of tuberculosis may be occurring. We conclude that Latino immigrants should be systematically screened for tuberculosis. (*Am J Public Health* 1986; 76:643-646.)

Introduction

Tuberculosis case rates in the United States as a whole have been declining consistently, but there are subgroups of the population that continue to have rates of disease considerably in excess of the national average. Of particular concern in this regard is the large number of foreign-born persons who have come to the United States from areas in which the prevalence of tuberculosis is very high.¹⁻⁴

The US Census Bureau reported a 61 per cent increase in the Latino population between 1970 and 1980 and provisional estimates place the current figure at over 16 million persons.⁵ Immigrants from Mexico and other Latin American countries constituted 40 per cent of all documented immigration to the US during the 1970s.⁵ In addition, there are an estimated six million undocumented immigrants, the vast majority of whom are from Latin American countries.⁶

The concern with tuberculosis in Latino immigrants is based, first, on their potential for their entering the country with communicable forms of disease. Second, because of the high prevalence of tuberculous infection among persons from most Latin American countries, they may develop active tuberculous disease after entering the United States. In either case, they would be potential transmitters of infection within the communities where they reside.⁷

A review of pediatric records between 1978 and 1983 at a community health center in San Francisco showed that 9 per cent of US-born and 53 per cent of foreign-born Latino children had significant reactions to tuberculin.⁸ Unsuspected transmission of tuberculosis among US-born Latinos was suggested by the high converter rates noted. Our concern was also heightened by the fact that, despite an increase in total number of Latinos in San Francisco, the absolute number of reported tuberculosis cases in this group has been stable in recent years. For these reasons, we undertook a community-based screening program to seek undetected cases of tuberculosis and to determine the prevalence of significant reactions to tuberculin among US and foreign-born Latinos.

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Methods

Tuberculin testing was performed between August 1983 and March 1984 at three health centers, two churches, and the Department of Public Health Tuberculosis Clinic, all of which are located in the predominantly Latino area of San Francisco. The screening program was well publicized within the Latino community. The evaluation included a tuberculin test, a chest film for persons who had a significant tuberculin reaction, and a sputum examination if indicated.

Subjects or an accompanying relative were questioned as to the subjects' age, birth place, time residing in the US, and whether or not they had received BCG vaccine. Scars from BCG were not looked for. Tuberculin skin tests were applied using purified protein derivative, 5 tuberculin units tuberculin (Tubersol®, Connaught). Tests were administered using the Mantoux technique and read 48 to 72 hours later by trained Latino health workers. A reaction of equal to or greater than 10 mm of induration was considered significant.

Tuberculosis cases in Latinos were recorded from the registry at the Tuberculosis Clinic in San Francisco and case rates derived from available population data.

Data were analyzed using standard techniques.⁹ Age-adjusted rates were calculated by the direct standardization method,¹⁰ using the 1980 Latino population in San Francisco as reference.¹¹

Results

Tuberculin Tests

A total of 2,193 tuberculin tests were applied, of which 1,871 (85.3 per cent) were read and are the basis of this report. The mean age of the population was 22.4 years; 56 per cent were female and 66 per cent were foreign born. Of the foreign-born persons, 23 per cent had resided in the US for one year or less and 65 per cent for five years or less.

The overall prevalence of significant reactions was 37 per cent. No differences were noted between sexes. Table 1 shows results of tuberculin testing by age and birth place. The US-born Latinos tested had a mean age of 11 years (SD=12) compared to a mean of 28 years (SD=19) among the foreign-born. The age-adjusted rate of significant reactions in foreign-born Latinos was 553/1000 compared to 221/1000 among US-born Latinos. Overall, Latinos older than 20 years of age had a greater prevalence of significant reactions than younger Latinos (3 per cent vs 23 per cent).

The differences in prevalence of significant reactions by birth place and age among the foreign-born are shown in

TABLE 1—Tuberculin Reactivity among Latinos in San Francisco, 1983–84

Age, Group	Total	Significant Reactions	
		N	%
US-Born	639	43	7
Age (yrs)			
0–4	219	5	2
5–9	183	4	2
10–19	137	8	6
20–34	50	9	18
35–90	44	16	36
Foreign-Born	1232	650	53
Age (yrs)			
0–4	70	17	36
5–9	163	26	16
10–19	205	59	29
20–34	403	296	73
35–90	391	252	64
Total	1871	693	37

Table 2. By country of origin, those from El Salvador and Guatemala had higher age-adjusted rates of significant reactions; there were no substantial differences among foreign-born Latinos younger than 20 years of age. There was no association between duration of residence in the US and the proportion of persons with significant reactions; a history of BCG vaccine did not influence the prevalence of tuberculin reactors in the foreign-born group at any age.

Chest Films and Follow-up

A total of 590 chest films were performed on the 693 persons with significant reactions to tuberculin. Abnormalities considered to be of possible tuberculous etiology were found in 148 (25 per cent), but 90 per cent of these were calcified granulomas. Seven persons with parenchymal abnormalities were classified as having past tuberculosis after sputum examination and radiographic follow-up in three months confirmed absence of activity. Current tuberculosis was diagnosed in two foreign-born children; one had lymphadenitis and the second a radiograph showing hilar adenopathy and parenchymal infiltrates. The yield of the program also included 425 persons younger than 35 years of age who were identified as potential candidates for isoniazid preventive therapy.

Tuberculosis in Latinos

The number of reported tuberculosis cases from 1970 to 1984 in Latinos living in San Francisco is shown in Table 3. The annual number of new cases did not vary greatly during this 15-year period but as a per cent of total cases, Latino cases have risen from 5 per cent in 1971 to 10 per cent in 1984.

Based on a San Francisco Latino population of 65,814 in 1970,¹² the case rate in this group was 27.2/100,000. The corresponding case rate for 1980 (population 83,373) increased slightly to 28.8/100,000.¹¹ In 1984, the estimated Latino population was 88,000, and the tuberculosis case rate was 30.7/100,000. If the estimated undocumented are included, the estimated Latino population in 1984 was 104,300 and the corresponding tuberculosis case rate would have been 26.0/100,000.^{5,6}

Discussion

Identification of immigrants from countries with a high prevalence of tuberculosis, combined with screening at the time of entry to the US, is the most satisfactory approach to tuberculosis control among these groups.¹³ However, sys-

tematic screening has been hindered in Latinos by the undocumented status of a large proportion of the immigrants. The influx of Latino immigrants from Mexico and Central America shows no signs of abating and, given current political and socioeconomic conditions in those countries, is likely to increase in the next decade.

Nationwide in 1983, there were 2,908 reported cases of tuberculosis in Latinos for an estimated case rate of 18.3/100,000.¹⁴ In Latino children younger than 5 years of age, the case rate was 10.2/100,000 compared to 4.2/100,000 for non-Latinos of the same age.^{14,15} This indicates a considerably greater frequency of transmission of tuberculous infection among Latinos.

The 37 per cent prevalence of significant tuberculin reactions found in this sample of Latinos was nearly five times the prevalence of reactors (7.9 per cent) from 21 large cities in the United States reported by the Centers for Disease Control.¹⁶ It is not clear, however, that the population we evaluated was representative of the Latino population in San Francisco. A process of self-selection in attending health care facilities and churches undoubtedly influenced the composition of the study groups. The response to a publicized campaign may have biased the sample toward a higher prevalence of reactors because of factors such as previous disease or positive family history of tuberculosis. This sample represents from 1.8 per cent to 2.1 per cent of all Latinos in San Francisco but the demographic variables of age, sex, and birth place are representative of the general population of Latinos.¹¹ Our data are an initial step in evaluating the magnitude of the tuberculosis problem in recent immigrants from Latin America but cannot be generalized without further substantiation.

Despite this limitation, our data demonstrate several important points. Both birth place and age were significant predictors of tuberculin reactivity. The marked difference in prevalence of infection between US-born and foreign-born Latinos younger than 20 years of age reflects the environments in which they have lived. The probability of being infected with *Mycobacterium tuberculosis* is considerably greater in Mexico and Central America where the incidence of tuberculosis exceeds that in the US by three to ten-fold.¹⁷ The lack of influence of time residing in the US as a predictor of tuberculin reactivity is consistent with most of the infections having occurred prior to entrance to the US. However, the 2 per cent prevalence of significant reactions in US-born Latino children younger than 5 years of age suggests the possibility of unsuspected transmission of tuberculous infection in the United States. Latinos living in large urban areas often share living quarters with recent immigrants, but the risk of transmission may not differ from that of other ethnic minority groups of a poor socioeconomic background.^{16,18,19}

A history of BCG vaccination has often been cited as a reason not to perform a tuberculin test because it cannot be determined if the reaction is the result of tuberculous infection or is from the BCG. The prevalence of significant reactions to tuberculin after BCG vaccination varies by vaccine type, method of administration, and population tests.^{20–22} Our data demonstrate that a history of BCG vaccination did not predict the rate of tuberculin reactors and thus substantiates the recommendation that tuberculin tests be performed and interpreted independent of the history of BCG vaccination.²⁰

This screening program found two cases of current tuberculosis among 693 reactors yielding an estimated case rate of 107/100,000. However, the relatively small sample size

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How Americans Spend Their Money (circa 1913)

Facts to be taken away and used:

Immorality and the social diseases (estimated).....	\$3,000,000,000
Intoxicating liquors	2,000,000,000
Tobacco	1,200,000,000
Jewelry and plate	800,000,000
Automobiles	500,000,000
Church work at home.....	250,000,000
Confectionery	200,000,000
Soft drinks	120,000,000
Tea and coffee	100,000,000
Millinery	90,000,000
Patent medicines.....	80,000,000
Chewing gum	13,000,000
Foreign missions.....	12,000,000

*Estimated on the basis of 300,000 public prostitutes and 1,000,000 clandestine prostitutes, the latter a ridiculously low estimate. No estimate is included covering the care of the sick, blind, insane, paralytic, or the expense of infant funerals.

—Fulton JS: The medical statistics of sex hygiene; such as they are. *Am J Public Health* 1913; 3:661-676.