

**Tuberculosis Among Pennsylvania Migrant
Farm Workers**

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By

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ABSTRACT

The purpose of this study was to determine the tuberculin positivity rates and the incidence of sexually transmitted diseases (STDs) among a population of seasonal, non-migrating farm workers. Participants were tested for TB sensitivity, syphilis, gonorrhea and chlamydia. Patients were afforded follow-up even if they returned home to Mexico during the course of their treatment. We found that the TB rate (15%) and the incidence of STDs to be significantly lower than in other studies of migrant populations. We hypothesize that exposure to urban commercial sex workers who frequent many migrant camps may be involved in the transmission of TB. Further research is needed to determine the incidence of TB among commercial sex workers and the extent to which transmission occurs between these two populations. We also describe our follow-up program and recommend a closer adherence to the Centers for Disease Control and Prevention (CDC) guidelines with respect to adequate health education and disease prevention.

INTRODUCTION

Tuberculosis (TB) is the single largest killer of people in the world resulting in 3 million deaths per year and has become the leading cause of death in people infected with HIV (1). In addition to HIV-infected persons, certain groups have a higher rate of TB than the general population. These groups include minorities, the homeless, prisoners, alcoholics, the poor and migrant farm workers. With respect to the last group, the Department of Health and Human Services (DHHS) estimates that there are 4.2 million migrant and seasonal farm workers in the United States (2). These workers often live in substandard housing and crowded conditions, and have numerous and complex health problems which frequently include communicable diseases such as tuberculosis and sexually transmitted diseases (STDs) (3). Control of tuberculosis in migrant farm workers presents special problems. The workers often fear deportation and are therefore reluctant to avail themselves of medical services. Furthermore their mobility between the United States and their country of origin as well as their migration within United States, makes it

difficult to provide continuity of health care. The prevalence of tuberculosis is remarkably higher among migrant farm workers than among other groups known to be at high risk for this infection. In a Centers for Disease Control and Prevention (CDC) survey, during the period 1985-1989, the risk of TB among farm workers was six times greater than among the general public (4). A study in 1988 demonstrated a 47% prevalence rate of TB infection among migrant workers 15-34 years of age and a 68% prevalence rate among those over 34 years of age (5). Ciesielski et al (1991), found the incidence of active tuberculosis among African-American farm workers to be 300 times that of the general population. They also found that the number of years in farmwork was the most significant risk factor for infection with tuberculosis, and describe tuberculosis as an occupational risk for farm workers (6). While TB has decreased among US-born persons, the proportion of TB cases among foreign-born persons has increased from 27% in 1992 to 39% in 1997 (7). This study and others have indicated that foreign-born persons may be the source of TB infections among conventional migrating farm workers (8,9).

We studied a unique population of year round non-migrating farm workers who are not part of the normal eastern migrant stream but instead, on occasion, travel between Mexico and Pennsylvania, employed by the mushroom industry in Berks County, PA. We determined the incidence of tuberculosis and STDs in this population. We also describe our follow-up program and recommend a closer attention to the CDC guidelines (10) with respect to adequate tuberculosis education and disease prevention.

METHODS

From July 1995 to July 1996, tuberculin-testing was conducted in 15 farm worker camps in Berks County, Pennsylvania. After informed consent, participants were tested for TB sensitivity by the Mantoux test. Each subject received 0.1mL of 5 tuberculin units of purified protein derivative (PPD) in the volar surface of the left forearm. The tests were interpreted after 48 hours. Reactions of 10 mm induration or more were considered positive. A history of Bacille Calmette-Guerin (BCG) was considered in the evaluation of the skin test, in accord with CDC guidelines (10). Subjects who reported previous treatment for TB or who were tested for TB within the past year were not included in the study. The PPD positive subjects were counseled and received a chest radiograph at the local county health department where isoniazid treatment was initiated. An outreach worker visited the TB patients on a weekly basis to ensure treatment compliance. In addition our screening program, a cooperative agreement with the Instituto Nacional de Salud Pública of Mexico, assured that patients were afforded follow-up even if they returned home to Mexico during the course of their treatment. This cooperative agreement between Mexico and the United States, designated GUAPA, was designed to share demographic and clinical data on Mexican migrant patients (11). The combination of patient counseling and education in conjunction with field follow-up and binational cooperation resulted in 100% treatment compliance. Subjects were also serologically tested for syphilis with an RPR and tested for gonorrhea and chlamydia by DNA probe assay (Gen Probe, Inc). All data was statistically analyzed by the chi-square test.

RESULTS

The target population consisted of 509 workers in 15 migrant camps. Of the 509, 413 (81%) were skin tested for tuberculosis. The results in Table 1 show that 61 (14.8%) had a positive TB reaction. Table 1 also shows that the majority of subjects (77%) were from Mexico. Thirteen percent of Mexicans tested positive for TB, while 20% of the non-Mexicans had positive TB skin tests. There was no significant difference in the positivity rate between Mexican and non-Mexican farm workers ($p=.31$). Table 2 shows TB skin testing results by age and gender. No significant difference in positivity rate was found among age groups ($p=.39$) nor between males and females ($p=.44$). None of the subjects tested had an STD.

DISCUSSION

Historically, high TB morbidity among foreign-born migrant farm workers has been cited in support of the view that tuberculosis is brought into this country by farm workers from areas where the disease rates are much higher than in the U.S., such as Asia, Latin America, and Haiti (7,8,9). We suggest another source for the introduction of active TB into the migrant population. This other source may be commercial sex workers who frequently service the migrant workers. The population represented in our project is a unique migrant population. Although they live in migrant camps with substandard housing and crowded conditions, they remain in one geographic area and do not move from state to state, as is typical of most migrant and seasonal farm workers. Furthermore because the camps are rural and dispersed, they do not represent an easily accessible and lucrative market for commercial sex workers. This is evidenced by the low rate of STDs in this population. Comparing positive rates for STDs and TB in this stable population with the rates among the true migrant stream populations suggests that STDs and TB are being acquired by migrants in the United States and spread to others in the migrant camps. For example, screening for TB in Florida (12), North Carolina (6), and New York (unpublished data, A. Muse, New York State Department of Health) found positive TB skin testing rates of 41%, 44% and 45% respectively. The Florida and New York studies also showed a significant incidence of STDs. The Florida study found 8% syphilis and 5% HIV. The New York study, farther north in the eastern migrant stream, found 27% syphilis and 7% HIV. Two unpublished studies also support our premise. Both of these studies involved migrant farm workers in neighboring Chester County, PA., where the Pennsylvania Department of Health has reported repeated outbreaks of STDs associated with commercial sex workers from Philadelphia, Wilmington and Baltimore. In one study, E. Velasco-Mondragon of the National Institute of Health of Mexico found that 74% of the male migrants reported having sex with commercial sex workers with 81% never or seldom using condoms. In the other study, S. Sivilla of the Chester County Health Department, reported a TB screening rate of 32%. These two studies, like our own, involve demographically similar non migrating Mexican farm workers of whom the majority are from the Mexican state of Guanajuato. However, in our non migrating rural population of whom 53% were from Guanajuato, we found a low TB skin testing rate of only 15% and no presence of STDs. Furthermore, when comparing positive TB skin testing rates specifically among Mexicans, the primary nationality of farm workers in Pennsylvania, with Mexicans in the New

York study the same disparity exists. We believe that this difference, 13% positive among non migrating Mexican farm workers and 27% positive among migrating Mexican farm workers, suggests a mode of disease introduction other than that of country of origin. The combined morbidity of TB and STDs among migrating farm workers (12) compared to the low incidence of these two infections in our study, suggest that TB and STDs are acquired and spread by commercial sex workers who frequent the camp sites. Therefore, we hypothesize that drug-using urban commercial sex workers who frequent the migrant camps, often residing for extended periods, represent a possible two way vector of disease transmission for both STDs and TB. Obviously, TB is not a sexually transmitted disease, but the repeated and lengthy close contacts with multiple partners in crowded, substandard living conditions represents a possible vector (13,14). Further research is needed to determine the incidence of tuberculosis among commercial sex workers and the frequency of transmission between these two populations in the migrant camps.

The results of this study demonstrate the value of identifying populations at high-risk for tuberculosis and establishing systems to ensure the provision of adequate medical intervention. Specifically, outreach programs, like ours, are necessary to identify those patients with tuberculosis who are potentially infectious and require therapy, and to identify asymptomatic persons who are infected with the tubercle bacillus (10,14). Such persons constitute a reservoir of potential clinical disease and should be evaluated for preventive therapy. Tuberculosis is a major health problem among these migrant workers, but organized efforts to detect, treat, and prevent disease in this group are difficult to establish and maintain. Even with an interstate tracking system, the transient nature of their occupation and the long duration of tuberculosis treatment make it difficult to provide screening programs and ensure patient follow-up, especially when the worker returns to his or her native country. The CDC emphasizes the need for follow-up in its TB elimination program (4,10). Through a pilot project initiated by the Pennsylvania Department of Health and the National Institute of Health of Mexico called GUAPA (11), our screening program was able to assure that patients were afforded follow-up even if they returned home to Mexico during the course of their treatment. The GUAPA project supported by the CDC and the Health and Human Services Office of Minority Health, demonstrated the first successful, binationally coordinated, epidemiologic intervention and medical treatment of STDs and TB between an interior state of the US (PA) and an interior state in Mexico (Guanajuato). Because of the success of the GUAPA project, the first binational migrant TB referral and tracking system called TB Net was initiated. TB Net is coordinated by the Migrant Clinicians Network of Austin, Texas in association with the El Paso City-County Health and Environmental District in partnership with the Pan American Health Organization and the US-Mexico Border Health Association. The success of GUAPA and the advent of TB Net truly ushers in a new era for TB control - an era, that with binationally coordinated intervention and treatment, could bring about a significant decline in the incidence of TB in both the United States and Mexico. However, without a national effort to provide basic health services for migrant workers through outreach screening and primary health care as carried out in our project, migrant populations will remain a significant reservoir for TB and STDs.

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Table 1. TB skin reactivity among Mexicans and Non-Mexicans

COUNTRY OF ORIGIN	Number tested (%)	Negative (%)	PPD Reactive	
			< 10mm number (%)	≥ 10 mm number (%)
Mexican	316 (77)	261 (83)	13 (4)	42 (13)
Non-Mexican	97 (23)	76 (78)	2 (2)	19 (20)
Total	413	337 (81)	15 (4)	61 (15)

Table 2. TB skin testing by age and gender

AGE	n	Negative			PPD Reactive < 10mm			PPD Reactive ≥ 10 mm		
		n	F	M	n	F	M	n	F	M
< 18	45	37	1	36	1	0	1	7	0	7
18-24	171	146	3	143	9	0	9	16	0	16
25-34	106	81	14	67	3	0	3	22	2	20
35-45	46	38	9	29	1	0	1	7	0	7
> 45	38	28	6	22	1	0	1	9	2	7
Unknown	7	7	1	6	0	0	0	0	0	0
Total	413	337	34	303	15	0	15	61	4	57