

Screening for Tuberculosis in Migrant Farmworkers
in Rural Delaware

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INTRODUCTION

Mycobacterium tuberculosis, the etiologic agent for tuberculosis, is responsible for more deaths each year than any other single pathogen.¹ Once believed to be nearly extinct in developed countries, tuberculosis is undergoing a dramatic resurgence worldwide. Migrant farmworkers are subjected to high risks of contracting tuberculosis, where it has been estimated to be six times greater than in the total U.S. population. In 1992, there was an estimated 2.7 to 4 million persons in the U.S. that were migrant and seasonal farmworkers.² Of this 2.7 to 4 million, only 13 percent had access to federally funded migrant health clinics.³ So the crisis at hand is obvious, here are a large group of people who are at a high risk of contracting tuberculosis and only a small percent have access to a health clinic.

Delaware was no exception to this rule. Mrs. Kathleen Russel, a health monitor from the Public Health Department stated that from 1980 to 1991 tuberculosis was on a steady decrease, but in 1992 the numbers reversed and began to rise. From 1992 to 1993 there was an increase in tuberculosis of almost 20 percent. While the numbers for tuberculosis increased through the recent years, it has been mostly associated with nonwhites and those of foreign descent. In 1986, 23 percent of the tuberculosis cases in the U.S. occurred in individuals born outside this country.⁴

The primary objective of this research was to screen migrant farmworkers for tuberculosis and provide good medical aid for those who tested positive. The prevalence rate of tuberculosis in the study population was assessed. The project was also attempting to answer why this population has such a high rate of tuberculosis. Could this high rate be due to their living conditions, work conditions, personal risk factors, environmental risk factors, or a sum of these conditions. These personal and environmental risk factors were assessed and an attempt to associate these factors with the rates of tuberculosis in migrant farmworkers was made.

METHODS

These objectives were obtained by administering the tuberculin skin test to the migrant farmworkers. They first completed an entry form which included their name, date of birth, place of birth, and place of work or camp where they resided. The Mantoux test, an intradermal cutaneous injection, was then given by Michael Meadors, Darlene Robinson, and Alejandro Heffess. Standard medical practices were used in injecting the 0.1cc inoculum of the Purified Protein Derivative. Michael Meadors and two nurses from the Delmarva Rural Ministries Inc., Kathy Ditlow and Sherry O'Connor, then read the skin results approximately 48 to 72 hours later. Follow-up examinations, primarily a chest x-ray, were scheduled to those who tested positive. A positive reading being 10mm of induration or greater. However, because this was a high risk population, those measuring 5 to 9mm of induration were also positive and scheduled for a chest x-ray. The follow-up examinations were coordinated by the James Williams Service Clinic. Three sputum samples would also be obtained from those who tested positive. Those who previously tested positive were not given this screening test, but instead assured that they completed their medication. Those who had received a Mantoux test within the past twelve months were also omitted from receiving the screening test.

An interviewer administered questionnaire in English and Spanish was conducted. This five minute interview was given to assess their personal and environmental risk factors for converting to a positive skin test, and their demographics. This interview also assessed risks for increasing the severity of tuberculosis as well as the risks of contracting HIV. This interview was also conducted on those who had tested positive for the PPD in the past and those who had received a Mantoux test within the past twelve months. An informed consent form was obtained before the questionnaire was administered.

A chart audit of those previously found positive for the PPD was conducted. The extent of their follow-up was analyzed. This history was updated and recorded in their files. Those without a history of completing their medication were sought out.

The target population was the migrant farmworkers in rural Delaware. A convenience sample was used on all those camps accessed by Delmarva Rural Ministries Inc. The sample included all migrant farmworkers ages six and above. The Mantoux test was performed at the camps where they worked or lived. The study was over a five week period from late June to late July. For statistical analysis, Epi Info version 5 was used. This was applied to all statistical calculations that were applicable. These applicable tests included the Chi square test, a 95 percent confidence limit, an ANOVA p value, and a Student's T Test.

RESULTS

The entire studied population included those that were given the Mantoux test, those that had a Mantoux test within the past twelve months, and those that had been positive for the tuberculin skin test. This population totalled 82 subjects. Of this 82, 69.5 percent were male. The mean age was 24 years old. The age range for this population was 1 to 67 years old. The mean age is lower because there was a pediatric clinic that provided Mantoux test to 23 children. There were eight people who were positive for this skin test; five people were found positive during this screening and three had a history of being positive. Of the three that were previously positive, two had completed the INH therapy and the other had resumed taking the medication. Those testing positive had an age range of 20 to 67 years old with a mean age of 33 years old. Seven of the eight testing positive were male. The prevalence rate of tuberculosis in this total studied population of migrant farmworkers was 10.25 percent.

The following statistics are of those who completed the questionnaire. This sub-population of the previous 82 had a sample size of 24. Of this 24, 17 were male (71%) and the mean age was 31 years old. There were three people who were positive for the skin test, one of which had previously had tuberculosis and completed the INH therapy. The ages for those testing positive were 26, 28, and 33 years old and the mean age was 29. All three subjects were male. The prevalence rate of this surveyed population was 12.5 percent.

Of the surveyed population, it was found that 42 percent smoked and 58 percent consumed alcohol. Of the three testing positive, only one smoked and two consumed alcohol. What I found to be interesting was that of all those surveyed, they had an average of six people living in the house with them, an average of two rooms per house, and an average of five people sharing a bedroom. Of the three positives', they had an average of six people per house, all had

only one room in the house, and therefore six people shared a bedroom with them.

For their working conditions, of all those surveyed 85.7 percent worked in a group (like a work crew) and they had an average of 19 people in the group. Those testing positive all worked in a group and the average number of people in this group was 27.

Other factors were analyzed in the questionnaire that predisposed for tuberculosis conversion, exacerbating tuberculosis, or for risks of contracting HIV. It was found that of all surveyed, 16.7 percent had a family member with a history of tuberculosis, 12.5 percent had stayed overnight in prison, one person had participated in IV drug use, 62.5 percent had stayed overnight in a hospital, and 75 percent had participated in unprotected sex. Of the three positives, two had participated in unprotected sex and two had been in a hospital overnight.

There was only one case of diabetes in the entire surveyed population. It was also interesting to note that there were no cases of steroid usage, renal failure, stomach surgery, asthma, or lung disease or damage. No one had reported a persistent cough or the production of a bloodstreaked sputum.

For the chart audit, there were 48 recorded cases of those having a positive skin test from 1992 and 1993. Only five had a history of completing their medication. 31 people had a recorded history of starting their therapy but no history of completing. 23 people had a chest x-ray, all of which were normal and did not show active tuberculosis. 17 people had three sputum samples collected and one had a positive sputum sample for the *Mycobacterium avium* complex.

DISCUSSION

The limitations of this study included the language barrier, the availability of the migrant farmworkers, the accessibility of the migrant work camps, and the small sample size. The majority of the migrant farmworkers were Spanish speaking. Only five camps had begun work and were accessed by the Delmarva Rural Ministries Inc. The migrant farmworkers work approximately eleven hours a day so they could only be found at lunch time and after work for only a couple of hours. This low level of accessibility provided a small sample size for the interviewer administered questionnaire.

Even though there was a small sample size, the crowding issue and the age factor hints at a problem with the prevalence of tuberculosis in the studied population. The statistics suggest that there is an association between the age of those testing positive to those testing negative in the entire studied population. The mean age of the entire studied population was 23.1 years old and the mean age of those testing positive was 32.6. This provided an ANOVA p-value of .126873 (the p value is equivalent to that for the Student's T Test, since there are only two samples) and a Chi square of 1.747. This means that there is an association between an older age and a positive skin reaction.

Another statistical suggestion is the crowding issue and those testing positive for the tuberculin skin test. Of the entire surveyed population, the average number of rooms per house

was 1.667 and of those three testing positive all had only 1 room. This provided an ANOVA p value of 0.22585 and a Chi square of 1.593. This may support the fact that living in a one room barrack style house is a problem and increases the risk of obtaining a positive skin reaction. Another statistical suggestion is the number of persons in the work group to those testing positive for the skin reaction. Of the entire surveyed population, the mean number in the group was 17.7 people and in the three positives' the mean was 27 people. This wide range gave an ANOVA p value of 0.10797 (the p value is equivalent to that for the Student's T Test, since there are only two samples) and a Chi square of 2.250. This provides a statistical association that those testing positive for the skin test had more people in their work group.

In the entire surveyed population, there was a mean of 6.333 persons living in a house together and of the three testing positive they had a mean of 5.667 persons. This gave a negative mean difference and an invalid p value. However, even though it was invalid, it is interesting to note how high the numbers are for those living together. This was the same in the number of people who shared a bed together, where in the entire surveyed population there was a mean of 5.524 and in the positives' there was a mean of 5.667. There was no statistical significance found in how many shared a bedroom or the age of those testing positive in the surveyed population to those testing positive for the tuberculin skin test.

An article in MMWR in 1992 stated in Florida the prevalence of tuberculosis among farmworkers was extremely high in the southeastern states. There was an 8 percent prevalence rate of a positive tuberculin skin test among persons they surveyed.⁵ This was higher than the 0.8 percent national serologic survey.⁶ It was later computed that the risk among migrant farmworkers was estimated to be six times greater than in the total U.S. population. My findings of a 10 percent prevalence rate amongst the entire studied population coincide with their findings. In the surveyed population, they had a prevalence rate of 12.5 percent which is slightly higher than their findings. Although both of these prevalence rates are slightly higher than those previously found, they are still around the same range.

CONCLUSION

As stated before, tuberculosis is on the rise. This is strongly present in migrant farmworkers. My findings of a 10 and 12.5 percent prevalence rate agrees with those high rates found in previous studies. The association of how many work together, the number of rooms in the house, and an older age can be made to a higher risk of obtaining a positive tuberculin skin test. With the farmworkers long work schedule and bad access to health care, it is hard to determine if these numbers will change. This is very unfortunate because tuberculosis is treatable and curable. Hope relies in screening and education to decrease these high prevalence rates and return these numbers to their past.

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