

---

## The Prevalence of Latent Tuberculous Infection at Nursing Homes in the San Juan Metropolitan Area

MÁXIMO BLONDET, MD; WILLIAM RODRÍGUEZ, MD, FACP

---

**We sought to establish the Tuberculin skin status of a representative sample of subjects residing in Nursing Homes in the metropolitan San Juan area. In comparison with similar populations previously described in the medical literature, no difference was**

**found in Tuberculin skin test reactivity in the studied sample.**

*Key words: Tuberculosis, Tuberculosis pulmonary, Tuberculin test.*

---

**D**uring the past few years, the number of patients being cared for in nursing homes (NH) in Puerto Rico (PR) as well as elsewhere has increased (1). Tuberculous disease is a common occurrence among the elderly in NH as it has previously described in the literature (2-4). The octogenarians of today are the survivors of a cohort who were in their 30's and 40's in the 1940's and 1950's. In PR at that time period, tuberculosis (Tb) was the second cause of death (5), for which this cohort should reflect signs of tuberculous infection. Therefore, the potential for developing active tuberculous disease in this population could be high, as well as the hazard for the health care worker (6) who takes care of these octogenarians. Recently, the Centers for Disease Control and the American Thoracic Society released their joint statement for the recognition and treatment of latent tuberculous infection (7). An objective documentation of the prevalence of tuberculous infection in such "closed" institutions as nursing homes should be reasonable in order to assess the need for resources in the treatment of latent tuberculous infection, the recognition of tuberculous disease and the subsequent elimination of tuberculosis from Puerto Rico and the United States. The purpose of this was study to document the tuberculin skin test (TST) status of a large nursing home population in the metropolitan San Juan area.

### Methods

The TST (Tubersol<sup>®</sup>, Aventis) was administered to residents of nursing homes at the Metropolitan San Juan area after informed consent (IC) was obtained. The study and the IC were previously approved by the Investigational Review Board of the University of Puerto Rico School of Medicine. Considering that there are 4500 residents in the state licensed NH in the metropolitan San Juan area, and with an estimated positive TST prevalence of 10%, a 5% margin of error, and a 95% confidence limit, a minimum sample of 134 subjects were calculated to be needed for evaluation.

All patients were enrolled in the study after IC was obtained, and had the TST done by the Mantoux technique (8). All tests were administered and interpreted after 48 hours, by the same qualified personnel. All subjects who had a negative initial TST and were 55 year of age or older, were retested two weeks later. A test was considered positive if the induration was equal or greater than 10mm, except in those who were found to be positive for the Human Immunodeficiency Virus (HIV), in whom 5mm was the cutoff point. Data collected included age, gender and TST status results.

### Results

One hundred forty eight (148) subjects were enrolled in the study, none of them were HIV positive. Their average age was 61 years, being 66% males, and 34% females. 34 subjects were found to have a positive TST. The average age of the latter was 61.5 year, being 68% males and 32% females. 114 subjects, or 77% of the total sample, were found to have a negative TST. The gender distribution was similar in this group. (Figure 1). 64 subjects received

---

From the Pulmonary and Critical Care Medicine Training Program, San Juan Veterans Affairs Medical Center, San Juan, Puerto Rico.

Presented in part at the American Thoracic Society annual meeting, San Francisco, California, May 2001.

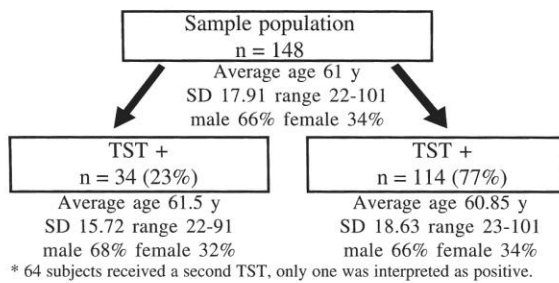
Supported in part by NIH K07HL03588, Tuberculosis Academic Award.

Address correspondence to: William Rodriguez, MD, FACP, Pulmonary and Critical Care Medicine Section, San Juan Veterans Affairs Medical Center, 10 Casia St, San Juan, PR 00921-3201. E mail: william@prmail.net

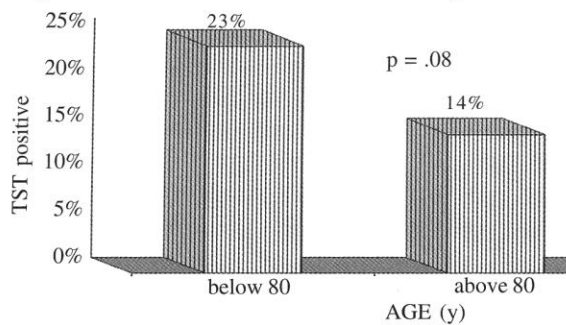
second TST, being positive in only one of them. In all subjects with a positive TST, their chest radiographs showed no findings suggestive of active tuberculous disease.

The largest number of patients with TST positivity was that between the ages of 40 to 49 year, however, proportionally, the segment with the highest incidence of positivity was that between 60 to 69 years of age. (Figure 2). When we compare the incidence of positive TST between those below and above 80 years, we found no statistical significance (Figure 3).

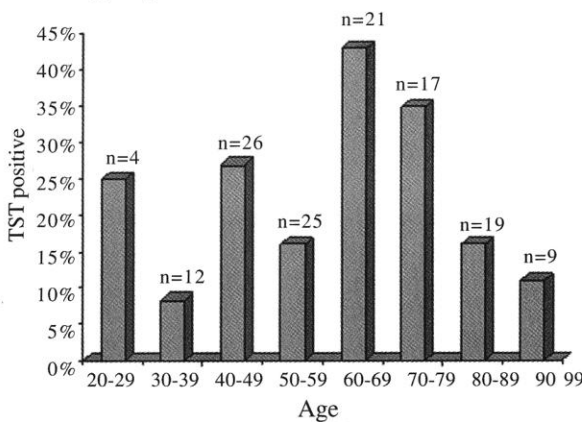
**Figure 1. Study Population**



**Figure 2. Latent tuberculosis infection in octogenarians**



**Figure 3. Latent tuberculosis infection in nursing homes according to age**



## Conclusions

This study revealed a 23% prevalence of positive TST in a representative sample of licensed nursing homes in the metropolitan San Juan area. The fact that 1 out of 4 of the patients studied had latent tuberculous infection (LTBI) raises the question that further medical follow-up should be given to these patients.

It is obvious that treatment of LTBI in this population should be ensued as previously recommended American Thoracic Society and the Centers for Disease Control (7). An important question raised through these findings is regarding the temporal development of LTBI by these TST+ patients. Was it acquired before admission or during their stay at the Nursing Home? How many of the patients will develop active tuberculous disease? Documentation of the tuberculosis skin status of patients at Nursing homes in the island should always be done. Proper documentation may have helped us in obtaining an answer to these questions. It will also help in effort towards our the eradication of tuberculosis in the island.

## Resumen

Buscamos establecer la respuesta a la prueba de tuberculina en una muestra representativa de sujetos que residen en hogares para envejecientes en el area metropolitana de San Juan. En comparación con poblaciones similares previamente descritas en la literatura médica, no se encontró diferencia en la reactividad de piel a la prueba de tuberculina en la población estudiada.

## References

1. Advance age subjects service establishments registry. Puerto Rico Family Department 2002.
2. Stead W. Tb among elderly persons: an outbreak in a nursing-home. *Ann Int Med* 1981;94:656-660.
3. Stead W, To T. Significance of the TST in elderly persons. *Ann Int Med* 1987;107:837-842.
4. Stead W, Lofgren JP, et al. Tb an endemic and nosocomial infection among the elderly in nursing home. *N Engl J Med* 1985;312:1483-1487
5. Rodríguez Pastor J. Tuberculosis mortality in Puerto Rico since 1950. [editorial] *Am Rev Tb* 1954;70:1099-1102.
6. Stead W. Special problems in Tb: Tb in the elderly and in residents of nursing homes, correctional facilities, long-term care hospitals, mental hospitals, shelters for the homeless and jails. *Clin Chest Med* 1989;10:397-405.
7. American Thoracic Society/Centers for Disease Control: targeted tuberculin testing and treatment of latent tuberculous infection, *Am J Respir Crit Care Med* 2000,161:4,5221-5247.
8. Dorke E, Grzybowski S, Alen E. Significance of the tuberculin skin test in the elderly. *Chest* 1987;92:237-240.