
Tuberculosis Prevention Questionnaire: Common Practices Among Pulmonary Medicine and Infectious Disease Specialists in Puerto Rico

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ABSTRACT. A survey about tuberculosis infection status, surveillance and protection practices among pulmonologists and infectologists was performed. A fourteen-item questionnaire was mailed. The survey was addressed to 108 pulmonologists and 61 infectologists. Responses were collected from 35 pulmonologists (32%) and 18 infectologists (29%). Sixteen out of 35 pulmonologists had a positive tuberculin skin test (TST) (46%). Nine of fourteen took at least 6 months of preventive therapy with isoniazid when converted. Three out of eighteen infectologists had a positive TST. 63% of the pulmonologists and 38% of the infectologists evaluate their TST every 12 months. 40% of the pulmonologists and 66% of the infectologists answered that they treat more than ten patients with tuberculosis annually. Interestingly, 50%

of the responder bronchoscopists use surgical masks instead of the recommended HEPA filter masks. 73% of the responders reported not having negative pressure rooms when performing procedures. Despite stamped-addressed envelopes and the relation of these professionals with the related issue, low participation was observed. Among the responders a low frequency of TST was observed, especially in those exposed to higher-risk procedures. Non-adequate facilities and lack of use of protective equipment was reported. Even though not representative of the entire medical community the results of this survey are concerning regarding educational and safety policies of our professionals and institutions. *Key words:* Tuberculosis, Tuberculin test, Attitude of health personnel, Compliance

In 1980, 700 cases of active tuberculosis were recorded in Puerto Rico (1). Since then, despite the flaring of the AIDS epidemic, a decline in the number of cases has occurred. In 1998, 271 cases were reported. Although this data may suggest that the fight against tuberculosis is being won, the fact is that the case-rate incidence has been kept almost unvaried in the past five years. Otherwise, Puerto Rico continues being a high-incidence area for Isoniazid-resistant strains (2). The thrilling discovery of

the *M. tuberculosis* genome has turned our minds toward a new promising horizon (3). As strategies are being developed taking this genetic approach into account, other problems concerning this disease are evolving. Multi-drug resistant tuberculosis and its risk to be acquired in the work environment are of great concern for our professionals. Prevention and close adherence to safety policies have proven to be one of our most efficacious tools in the control of this disease. In this aspect, the role of the health care worker as provider of treatment and surveillance and as educator for patients and relatives, has acquired more relevance (4). In order to document the health care worker knowledge and attitudes toward tuberculosis prevention in Puerto Rico, we performed a survey among Pulmonary and Infectious Diseases Specialists in our Island. The former group is involved in the care of patients with tuberculosis disease and performs several high-risk procedures. The second has been invoiced elsewhere as a control group for tuberculosis prevalence in exposed physicians (5).

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Methods

In May 1998 we mailed a simple questionnaire to 105 Pulmonologists and 61 Infectologists, this sample comprising the total number of active specialists in our island as per the mail registry in both groups. The questionnaire was anonymous and consisted of 9-check mark (yes/no or a/b/both) and 5 simple questions. Prior to sending it and to prove the complexity of the survey six residents, blinded for the contents of the survey, were given the questionnaire. They completed it in less than five minutes. An informative letter accompanied the questionnaire. To facilitate the return of the responses, a pre-stamped self-addressed envelope was sent.

Results

Thirty-six out of 105 Pulmonologists and 18 out of 61 Infectologists responded the survey. The response rates were 32% and 30% respectively. Sixteen out 34 Pulmonologists (46%) and 3 out 18 Infectologists (17%) who responded our survey had a positive tuberculin skin test (TST). Among the former group, nine of sixteen took preventive therapy when converted, but 7 did not take it, three of them developing active disease in the 2-year following period. All the Infectologists who converted took preventive therapy. Two thirds of the responders confessed that they treated more than 6 patients every year with active tuberculosis and therefore they could be classified as moderate or high-risk personnel for exposure (4). When asked about how frequently did they perform their TST, 16 out 19 TST negative Pulmonologists have their TST done less than twice a year. In the infectious diseases specialists group, two thirds of them performed their TST at least once a year. Sixty percent of the surveyed bronchoscopists did use surgical mask in their high-risk procedures in substitution of the recommended HEPA filter masks. Among them, there were no differences between those who were TST positive or negative. Moreover, 73% of the responders stated that they did not have negative pressure rooms for the procedures they performed. More than 90% of the responders knew about what a HEPA mask is and about negative pressure guidelines. Both groups were not different in age, sex, and type of practice (private or academic).

Discussion

The results of this survey should be discussed from different points of view.

The first is the high prevalence of tuberculosis infection among our Pulmonologists. The prevalence of positive

skin testing among Health Care Workers (HCW's) has been determined to be between 10-40% (6-7). The prevalence observed among our Infectologists is within this range but it was unexpectedly high in our Pulmonologists. Previously, one study defined the risk-differences between Pulmonary Medicine and Infectious Diseases Fellows, showing that the first group was more prone to be exposed and so to be infected (5). Pulmonary Medicine Specialists perform procedures that have been classically associated with high rates of nosocomial transmission (i.e. bronchoscopies, aerosol therapies, management of patients with ventilators...) (8). Thus, this may explain the higher prevalence of tuberculosis in this group when compared with infectologists. However no conclusive reason may be given to the high prevalence presented. Is there a lack of protection when performing procedures?

The second point is the low frequency of TST performance, especially among Pulmonologists. The concerning issue is that almost two thirds of them did not test themselves more than once a year. The CDC recommendations intended to early detect infection in health care workers exposed to tuberculosis are clear in this respect. High-risk personnel must do their test every 3 months or at least every 6 months with contact surveillance and re-test (3,8-9). Unfortunately, the non-accomplishment with these guidelines by physicians has been previously mentioned elsewhere (5,10). The implementation of strict institutional policies and surveillance has been advocated to correct this problem (3,5). This lack of compliance may be observed also in the omission of preventive therapy when conversion occurs. So, almost 40% of the converters in the pulmonologists group did not take preventive therapy, although no contraindication was told for that purpose. Three of them developed active disease, and this could be avoided if all of them had taken the prevention. This fact may be explained not only by the fright of the professional about the "possible" noxious effects of Isoniazid but also should be directly related to the next issue.

The third issue to be discussed is compliance. Physicians and HCW's compliance is one of the major problems in nosocomial transmission. The historical background may explain this issue. Tuberculosis consideration as a nosocomial-transmitted disease has been accepted in the second half of this century. In the 1910's and twenties the medical knowledge supported the theory of non-transmissibility of the bacillus to the HCW. As per a respected 1924 chest disease textbook: "... *There is no danger from the expired air of consumptives... a tuberculosis sanatorium is probably the safest place one*

can be... ” (12). It was not until the thirties when the first reports about the increased risk of infection in the HCW were seen (13-14). Finally, in the forties and fifties, the increased risk of nosocomial infection was universally accepted (15-16). We still could be dealing with misconceptions about the risk of transmission in the health care environment. This may be the reason for the lack of compliance with prevention and safety guidelines.

In the nowadays Puerto Rico, where the health care industry is in a high tide as a source of economic development, the health care institutions must ascertain their role in prevention of this disease (17). In our survey sixty percent of the responder bronchoscopists did not use HEPA filter masks. It then should not be strange that our hospitals are not fulfilling the adequate protective measures and are not providing the necessary personal protective equipment. In 1992, a national survey documented that two thirds of the hospitals surveyed offered surgical mask for protection of employees when contacting people with suspected or non-suspected tuberculosis (18). It may be concluded from our survey that our hospitals are not providing enough protective equipment. Either if they have other type of mask available rather than the surgical one, or if they prefer not to use another mask, the safety policies are definitely not being followed. Moreover, our concern is increased by the fact that every three out of four responders did not have bronchoscopy suites with negative pressure. Although we cannot extrapolate the data obtained in this survey to all the hospitals in our island, common sense alert us about the lack of preventive measures. In 1987, the San Juan City Hospital was found with serious deficiencies in isolation rooms and negative pressure ventilation, specifically in the AIDS ward. The result of those “deficiencies” was the TST conversion of more than a half of the employees working in the closest area to that ward (19). Since then, motivated for this example, some institutions have implemented serious and efficacious measures in order to control the infection rate among HCW's. In 1993 the San Juan VA Medical Center established new policies intended to prevent the transmission of disease in the work environment and to early detect infection cases among employees. The result has been a 15-fold drop in the incidence-rate of skin conversions among the VA employees' (20).

Finally, the low response rate we obtained does not allow statistical analysis. Similar response-rates have been obtained elsewhere with surveys done among non-affiliated physicians (5). Our data although not representative of the entire medical community of our island, should be paid careful attention. An important part

of the war against tuberculosis relies on prevention of disease transmission. It just should be done.

Resumen

Se llevó a cabo una encuesta sobre el estatus de infección de tuberculosis y las prácticas de vigilancia y protección a neumólogos e infectólogos. Un cuestionario de 14 preguntas fue enviado por correo a 108 neumólogos y a 61 infectólogos. Se recibió contestación de 35 neumólogos (32%) y 18 infectólogos (29%). Dieciseis de 35 neumólogos tenían una prueba en piel de tuberculina positiva (46%). Nueve de 14 tomaron al menos 6 meses de terapia preventiva con isoniazida cuando convirtieron. Tres de 18 infectólogos tenían una prueba en piel de tuberculina positiva. 63% de los neumólogos y 38% de los infectólogos realizan la prueba en piel de tuberculina cada 12 meses. 40% de los neumólogos y 66% de los infectólogos contestaron que tratan más de 10 pacientes con tuberculosis anualmente. Interesantemente, 50% de los broncoscopistas usan mascarillas de cirugía en vez de las mascarillas con filtros de la HEPA recomendadas. 73% de los que respondieron reportaron no tener cuartos de presión negativa cuando realizaban los procedimientos. A pesar de los sobres pre-dirigidos y la relación de estos profesionales con este problema, una pobre participación fue observada. Entre los que respondieron, se observó una incidencia baja en pruebas en piel de tuberculina, especialmente en aquellos con procedimientos de alto riesgo. Las facilidades inadecuadas y la falta de uso de equipos de protección fueron señaladas. Aunque no representa la comunidad médica en su totalidad, los resultados de esta encuesta conciernen a la educación y prácticas de seguridad de nuestros profesionales e instituciones.

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