

Editorial

Resurgent Nosocomial Tuberculosis: Consequences and Actions for Hospital Epidemiologists

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Nosocomial tuberculosis did not receive the respect it deserved during the 1980s, for several reasons. First, tuberculosis was thought to be a disappearing disease, to the extent that a Program for Elimination of Tuberculosis was created by the Centers for Disease Control (CDC).¹ Second, rather than its previous pattern as a disease of the entire population, by the 1980s, tuberculosis had become primarily a disease of the disadvantaged—cases of tuberculosis became a rarity except in U.S. hospitals serving the homeless and the helpless. Because these hospitals and their patients tend to be ignored, tuberculosis was lost to general public and medical attention, especially in comparison to new problem infections like acquired immunodeficiency syndrome (AIDS). Third, virtually all tuberculosis isolates were susceptible to the two major drugs used for treatment: isoniazid and rifampin. The tuberculocidal action of these drugs in combination made treatment shorter and easier than ever before. When resistance to these drugs was found in occasional strains, these usually emerged from initially susceptible strains in patients who were noncompliant with therapy or in patients from other countries. Resistant strains seldom were found in clustered fashion and usually could be treated outside the hospital setting. Thus, the threat of nosocomial tuberculosis seemed diminished.

During this period, tuberculosis control programs at the federal, state, and local level were cut back or eliminated.² Similarly, hospital guidelines and policies developed to prevent nosocomial spread of tuberculosis fell into disuse and neglect. These poli-

cies had been developed when care of tuberculosis patients was moving from specialized tuberculosis sanitariums to general acute care hospitals. Included were extensive guidelines for respiratory precautions, laboratory studies, and proper chemotherapy.^{3,4} Parts of these guidelines were based on minimal objective evidence. How long should a patient newly started on antituberculous chemotherapy remain on isolation precautions before the risk of contagion ends? How many sputum cultures are needed to define presence or absence of tuberculosis? Should these sputum cultures be obtained as soon as possible, or should they be spread out over a period of days? How important is proper masking compared with airflow as a preventive measure? How can a diagnosis of tuberculosis be made more speedily, and how can drug-resistant strains be identified earlier? As tuberculosis declined in attention, the research needed to deal with these and other questions never was funded and never was done.⁶

Guidelines for dealing with tuberculosis in hospitals also specified continuous surveillance of tuberculosis infection in hospital workers.^{4,7} In the 1980s, however, tuberculosis seemed to be disappearing, and AIDS and its complications became prominent. Hospitals in many communities where tuberculosis had become rare found that continued tuberculin skin testing of their employees appeared to be costly and of minimal benefit.^{7,8} Many hospitals still encountering tuberculosis patients now were bearing the brunt of the AIDS epidemic. AIDS was almost always fatal, and tuberculosis was almost always treatable, so marshall-

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ing scarce resources from routine infection control programs like tuberculosis screening to AIDS care was relatively easy. Thus, programs for tuberculin skin testing of healthcare workers remained on the books, but incentive to see that they were done well declined.

All this has changed dramatically in the past few years. Tuberculosis has been resurgent, thanks in large part to the rise in homelessness, loss of healthcare benefits for many poor and not-so-poor Americans, and the continued upsurge of human immunodeficiency virus (HIV) infection.⁹⁻¹⁴ For the first time in many decades, annual case rates of tuberculosis are increasing. Tuberculosis now is "out of control in many areas of the United States."¹⁵ Multiresistant tuberculosis strains have become widespread in several areas of the country.^{2,16} The ineffectiveness of therapy for these multiresistant tuberculosis strains has caused such concern that a National Action Plan to Combat Multidrug-Resistant Tuberculosis has been developed speedily.¹⁷

Nosocomial tuberculosis also has returned as a major concern. In this issue, the increasing frequency of tuberculin skin test conversions in employees of a university hospital in 1989 compared with a baseline period of several earlier years is documented by Ramirez and coworkers.¹⁸ Since their paper was accepted for publication, several other reports have appeared describing nosocomial transmission of infection to both patients and healthcare workers in the United States.¹⁹⁻²³ Major factors enhancing such transmission include the difficulty of recognizing tuberculosis in HIV-infected patients²⁴ and the enhanced likelihood of early progression to disease in HIV infected patients.^{2,13} Nosocomial transmission is a particular concern in areas where multiresistant tuberculosis strains are prevalent: these strains resist initial treatment with usual first-line drugs, which in turn means a longer period of contagiousness during hospitalization. Therapy of multiresistant tuberculosis strains is difficult enough in patients with intact host defenses, but in immunocompromised patients like those with HIV infection, mortality rates in some hospital outbreaks have been terrifyingly high.^{13,16,25}

Control of hospital outbreaks of tuberculosis is a concern whether or not the organisms are drug-resistant. Extensive control measures are recommended by the CDC through its Hospital Infections Program and its National Institute for Occupational Safety and Health (NIOSH).^{25,26} These guidelines focus on environmental controls (ventilation of rooms, decontamination of air and equipment, etc.), protective equipment for personnel (masks, etc.), and patient care practices (respiratory isolation precautions, enhanced laboratory diagnostic procedures, etc.).

Unfortunately, the validity of these policies is hindered by the lack of attention to tuberculosis research in the past two decades. How long isolation is needed, how to recognize the patient who remains contagious while on therapy, how to prevent airborne spread, how to make a rapid diagnosis of infection or of drug resistance—such questions and others need to be answered to make these guidelines for nosocomial tuberculosis control both effective and cost-efficient.

Hospital epidemiologists are at the forefront of attempts to control nosocomial tuberculosis and individually must take several actions to deal with the problem. In hospitals affected by the resurgence of the disease, they must evaluate the adequacy of institutional airflow systems, of procedures for recognizing and isolating potential cases, of guidelines for initial empiric therapy, of laboratory procedures for diagnosis and susceptibility testing in the shortest time possible, and of mechanisms for training healthcare workers to do all these things.^{25,26} Hospital epidemiologists in affected hospitals also must examine closely their relationship to the local, state, and federal programs for control of tuberculosis. When these are ineffective, the impact on the hospital can be great, especially when homeless patients who are still contagious cannot be discharged because there is no provision for their housing, or when ineffective community followup for therapy results in tuberculosis patients presenting for readmission to the hospital time and time again.

One measure of clear value in dealing with nosocomial tuberculosis today is effective surveillance of healthcare workers for tuberculosis. This permits recognition of potential hospital transmission episodes and provides the opportunity for chemoprophylaxis of workers whose tuberculin skin tests become positive, whether the infection is acquired in the hospital or not. The paper by Ramirez et al¹⁸ reminds us of the importance and the benefits of carrying out this surveillance. Hospital epidemiologists should review the current program for employee testing in tuberculosis-impacted hospitals to determine how extensively and effectively it surveys all workers in the institution. In some settings, these should include not only employees but also healthcare students, temporary help, physicians, volunteers, and others. Further attention should be given to assessing whether healthcare workers with positive tuberculin skin tests have received appropriate followup evaluations to detect tuberculosis disease, and whether those for whom chemoprophylaxis is appropriate have completed the program.

Hospital epidemiologists also must respond as a group to the resurgence of tuberculosis. Their professional society, the Society for Hospital Epidemiology

of America (SHEA), must rise to the challenge of seeing that nosocomial tuberculosis is dealt with in effective and efficient ways. Action is particularly needed in the following three areas:

■ Regulations to deal with tuberculosis care are now being developed by a cacophony of governmental agencies. For example, the Occupational Safety and Health Administration (OSHA), in association with NIOSH, is said to be developing new proposals for masks and respirators for healthcare workers caring for patients with tuberculosis.²⁷ The value of these guidelines is of concern because in its regulations for dealing with respiratory pathogens, as for its bloodborne pathogen compliance document, OSHA is not required to support its findings with scientific certainty.²⁸ Other tuberculosis control measures currently are being proposed as “a leap of faith” in the absence of studies to document their usefulness.²⁹ SHEA and other relevant professional organizations must work to avoid an overreaction in which ineffective or minimally effective measures are mandated on the basis of political or emotional rather than scientific considerations.³⁰

■ SHEA must work for improvement of the federal, state, and local tuberculosis control programs that were gutted during the 1980s. These programs must be re-established on a sound basis to assure that the onslaught of new tuberculosis patients seeking admission to acute care hospitals will cease.² It would be a mistake to focus control resources exclusively on areas where multiresistant tuberculosis organisms are present, as the recrudescence of tuberculosis is a problem for hospitals regardless of the organism's resistance. SHEA and other relevant professional societies may have to provide a strong voice to get this message through to the federal planners working on national plans for control. SHEA must be involved in identifying and getting top priority for research on the most practical ways to deal with tuberculosis—which are the major components of cost effectiveness and which add minimal value compared to their cost?

■ The linkage between HIV infection and nosocomial tuberculosis forces re-examination of the role of HIV-positive workers in healthcare. Deciding how to present the information about risk of acquiring multiresistant tuberculosis and its severe consequences to HIV-infected healthcare workers now becomes a major concern, as these individuals will need to make an informed decision about whether remaining in healthcare settings where patients with multiresistant tuberculosis strains are present is an acceptable risk. In addition, research is urgently needed to learn whether HIV-infected healthcare workers are more likely than others to transmit tuberculosis in the healthcare setting, so that the

institution can determine its risk from employing HIV-infected workers in settings where tuberculosis may be present. SHEA should assist in answering these important questions.

These and other tasks will require networking with other relevant professional organizations. It will also require a raising of consciousness among the “old guard” of tuberculosis professionals about the role that hospital epidemiologists have to play. Groups like the American Lung Association in the past have depended almost exclusively on pulmonary physicians and the American Thoracic Society for professional and scientific advice about tuberculosis care. This results from patterns that existed decades ago, where tuberculosis care resided almost exclusively with pulmonary physicians (then called “phthysiologists”) in sanatoriums. With the switch of tuberculosis care to the acute care hospital, attempts to control spread now are in the hands of the hospital epidemiologist. SHEA and its members must update organizations (like the American Lung Association) on national, state, and local levels about the current patterns of care and the role that hospital epidemiologists play. Fortunately, SHEA is part of the National Coalition for the Elimination of Tuberculosis, and this membership offers a good opportunity to send this message.

Appropriate response to the resurgence of tuberculosis will require hospital epidemiologists at impacted hospitals to work closely with the institutions physicians (especially pulmonary), nurses, laboratorians, engineers, and administration as well as with public health agencies coordinating tuberculosis care in the community. While this will require new efforts, the skills required are the same ones already honed on other hospital epidemiology tasks. This work ultimately will enhance the value of the hospital epidemiologist to impacted acute care hospitals and the value of hospital epidemiology to the nation. The time to act is now, not only for individual hospital epidemiologists but also for their professional society.

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