The Tenacity of Tuberculosis

Tuberculosis [TB], paleontologists tell us, has been with us since prehistoric antiquity, a conclusion based upon their demonstration that the fossil bones of some of our ancient ancestors show the distinctive stigmata of TB. Nor, in recent centuries, has TB been a rare or exotic affliction. Indeed, many medical demographers claim that TB, through the last millenium, has affected more humans, and killed more, than any other known contagious agent.

Many of the infectious diseases that have burdened mankind historically seem to have arisen in a defined geographic site and then, belatedly, spread to the remainder of the globe. Cholera, for example, confined itself to the Ganges delta for centuries until aggressive colonialism within and beyond the eastern Indian subcontinent accelerated its 19th Century global spread (arriving in this nation by 1831).. The same has been true of such initially regional diseases such as bubonic plague, measles, influenza and smallpox. TB, in contrast, has surfaced in virtually all geographic regions, in all cultures and in all of the many centuries of recorded history. If TB had once been localized to a specific geographic site – a likely event – that site has yet to be demonstrated.

When confronting the problem and even the extent of TB, it is imperative to understand the unique interrelationships between the TB organisms and humans. The dynamics of clinically active TB can only be understood by first acknowledging the continued intimacy involving humans and TB germs.

For the sake of discussion, consider the world to be divided into four biologically discrete groups: Those humans with clinically active TB, usually involving the lungs; those individuals who had previously had active TB but are now cured; those who currently harbor a few TB germs sequestered in some internal lymph node but show no present sign of active TB; and finally, those who have yet to encounter the TB bacilli.

Three of these TB-related categories are self-evident; it is the third, those ostensibly healthy individuals who have hidden clusters of "sleeping" TB germs, that create epidemiologic nightmares. These TB germs may remain dormant for years, even decades. The World Health Organization estimates that one-third of the world, about two billion humans, are in this category. These are the vulnerable ones: When they are confronted by great physiologic stress, when undergoing extensive radiation therapy or when their immune system is suppressed [as in HIV infection] they then face the likelihood of TB activation.

The historic resurgence of TB in Europe coincided with the Industrial Revolution of the 17th and 18th Centuries as factory-type employment caused massive migration into the cities. The resulting urban overcrowding provided the ideal setting for the air-borne spread of the germs of TB. Other 18th Century social institutions such as the expanded prisons, work houses, orphan asylums and enclosures for the mentally deranged conjoined to make TB the leading cause of adult mortality.

TB followed the same pattern in this nation: New immigrants concentrated in the cities rather than the rural communities, lodging particularly in the overcrowded urban tenements where the spread of airborne disease was augmented by poor nutrition, poor air circulation in the slum dwellings and, in general, an environment of pervasive poverty.

Until recently, the United States could take pride in its gradual conquest of TB, what the Victorians had chosen to call the white plague. The development of better, healthier housing, the various aggressive public health measures to identify early TB and rapidly segregate its victims into institutions called sanatoria thus diminishing the major source of TB contagion. (The U.S. Public Health Service estimated that the average person with active TB infects about 20 other humans during his lifetime unless he is isolated during the active phase of his disease in a TB sanatorium.) These TB institutions, typically in rural settings, fulfilled a dual purpose: a quiet place for consumptives to heal; and a preventive measure to interrupt the customary paths of TB communicability. The incidence of TB then fell precipitously even before the introduction of streptomycin in the late 1940s, the first antibiotic agent capable of curing TB.

Toward the end of the 20th Century, however, the incidence rate of active, clinically apparent TB rose dramatically, in this nation. In the New York City borough of the Bronx, during the last decade of the 20th Century, public health officials were confronted with three critical problems enhancing the spread of TB: first, an increase in strains of TB now resistant to the customary antibiotic drugs; second, the crowded tenements of the region were becoming increasingly over-congested with newly arriving Caribbean and Asiatic immigrants; and third, an epidemic of HIV infection spreading rapidly within this inner city community. What was taking place in the Bronx was reproduced in numerous other impoverished enclaves of the United States.

The problem has not reached the level of national concern in this nation largely because the recrudescence of TB has been confined to our immigrant and poverty-stricken population. The rate of TB amongst established, middle-class communities remains at a very low level. And in the remainder of the world? Drug-resistant TB is now increasing dramatically in the new urban centers of South Africa, India and China coincident with their rampant industrialization. And wherever HIV infection has been implanted, as in sub-Saharan Africa, so too has TB returned to become a major public health threat. HIV and TB have now merged, in synergy, to create an evil confederacy.

– Stanley M. Aronson, MD

Disclosure of Financial Interests

Stanley M. Aronson, MD, has no financial interests to disclose.

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