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Infectious Diseases

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Infectious Diseases

Infectious diseases were a far more important cause of mortality and morbidity in the wars of the early American republic than injuries sustained in battle. The inordinate impact of infection was a direct result of the state of medical science and training in the late 18th and early 19th centuries—a dismal situation that was by no means unique to the young American nation.

At the onset of the American Revolution in 1775, there were approximately 3,500 people (essentially all men) practicing medicine in the colonies, but only about 200 of those actually had medical degrees. The oldest medical school in the colonies had existed for barely 20 years, so the large majority of university-trained physicians had obtained their degrees in Europe—mostly England and Scotland and a few in France. Physicians, along with ministers and lawyers, were usually the best-educated men in their communities, and doctors played a disproportionate role in both administration and military command in the Revolution.

In the pre-Pasteur age there was no understanding of the microbial etiology of infectious disease, and there were only a few preventive measures that were useful and many that were actually detrimental. Perhaps the single most successful intervention in infectious disease in the American Revolutionary War was the use of variolation (inoculation) in the prevention of smallpox in the Continental Army. Smallpox is a viral disease that carried an approximate 30% mortality rate and an almost universal morbidity, with scarring and blindness being the most significant sequelae. In 1718, Lady Wortley Montague had brought the Turkish practice of intentional induction of the disease by transmitting the virus from a patient with a mild case of smallpox to healthy individuals. The success of this procedure is based on two elements. First, once a person has smallpox, immunity is permanent. Second, mortality from variolation was much less than that of the naturally acquired disease. Based on that, George Washington had his wife variolated and mandated that the entire Continental Army undergo the procedure in 1777. The decision was highly controversial and may well have been precipitated by the forced withdrawal of Continental Army forces from Quebec in 1775 in the wake of a smallpox outbreak. Mortality from smallpox in the Continental Army plunged to a mere 1-2 percent as a result of mandatory variolation.

Arthropod-borne infectious diseases had plagued the colonies since the institution of the slave trade in the mid-1600s. Yellow fever is a viral disease transmitted by the *Aedes aegypti* mosquito and had caused repeated epidemics

in seaports from New Orleans, Louisiana to Halifax, Nova Scotia. Thomas Jefferson opined in 1800 that America would never have cities on the scale of those in Europe because population centers were doomed to periodic depopulation by yellow fever. The other common mosquito-borne disease was protozoal malaria. Malaria was particularly common in the warmer southern colonies, and George Washington had suffered from the disease as a young man. Malaria was actually one of the few infections for which there was an effective treatment. When the Spanish conquered the Peruvian Incan Empire, they were introduced to cinchona bark and its effectiveness in treating fever in general and malaria in particular, and the bark had become a staple of the physician's medicine chest for more than a century.

Although yellow fever and smallpox epidemics were more dramatic, dysentery was far more common and almost certainly a greater cause of disability in both the Revolution and War of 1812 than the mosquito-borne illnesses. Dysentery had accompanied soldiers on campaign with dismal regularity since the earliest recorded wars. Washington cited the biblical book of Deuteronomy a justification for requiring that latrines be located at a distance from campsites. Dysentery generally results from infection with *Escheria* or *Salmonella*, *Shigella*, or *Campylobacter* species. Although it is usually not fatal, dysentery markedly impairs an army's effectiveness. In August 1813 fully one-third of the American army was on sick report, and virtually all of those suffered from dysentery. No effective treatment for the disease existed (although some harmful procedures such as bleeding and cathartics were used) and most officers lacked even a basic understanding of field sanitation.

Venereal disease was epidemic in both the Revolution and the War of 1812. There was no effective treatment, although mercurial were regularly employed. In general, punishment was used in lieu of therapy. During the Revolution, officers were fined \$10 and enlisted men \$4 if they were diagnosed with venereal infection. The proceeds were used to buy dressings and bedclothes for the military hospitals.

Finally, wound infection was depressingly common. In fact, it was universally accepted that wounds would not heal until they had begun to drain so-called laudable pus, a situation that we now understand to be the result of staphy-lococcal infection. During the Revolution, approximately 25 percent of the wounded who were admitted to hospitals died, and the vast majority of those succumbed to unrelated infections. Battlefields were often farmland that had been contaminated with bacteria containing animal feces for years. Surgical

procedures were carried out with no understanding of antisepsis and no attempt to prevent wound contamination. The lucky patients developed staph infections and had some chance of survival. The unlucky ones contracted streptococcal infection (erysipelas) or anaerobic infection and developed the almost universally fatal gas gangrene. In the final analysis, bacteria killed far more soldiers in the early republic than did bullets.

BERT CHAPMAN AND JACK MCCALLUM

See also

Medicine, Military; Rush, Benjamin; Webster, Noah

Further Reading

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