
HISTORICAL

THE MILITARY MEDICINE DURING PANDEMICS

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ABSTRACT

Wars and illnesses have been associated in the history as armies and pathogens have met on the battlefield. Cholera affected the mankind for at least a millennium and it still represents a major concern because it still is a cause of morbidity and mortality worldwide (recent epidemics have been reported in Zimbabwe (2008–2009) and Haiti (2010)). Influenza pandemics have also caused major morbidity and mortality for centuries. Since 1918, the world has experienced three subsequent pandemics. The estimated global mortality associated with these events was significantly lower, with approximately 1 million for the 1957 H2N2 and 1968 H3N2 pandemics and fewer than 0.3 million for the first year of the 2009 H1N1 pandemic. During the 2003 severe acute respiratory syndrome (SARS) pandemic, the use of quarantine, border controls, contact tracing and surveillance proved to be effective in controlling the global threat in just about 3 months. Unfortunately, new viruses can abruptly change to become a more human-adapted virus, spreading efficiently from one person to another and causing significant morbidity and mortality worldwide, as SARS-CoV 2 recently did.

KEYWORDS: *military, medicine, role, achievements, pandemics*

TEXT

Even before the era of bacteriology, the illnesses and the epidemics were thought to be the military enemies of mankind [1].

Wars and illnesses have been associated in the history as armies and pathogens have met on the battlefield. The conquistadores brought some illnesses that devastated the New World; for example, the typhus that affected so badly Napoleon's armies, as well as the typhoid fever, that practically humiliated the American Army in the Spanish-American War [2].

Cholera affected the mankind for at least a millennium and it still represents a major concern because it still is a cause of morbidity and mortality worldwide (recent epidemics have been reported in Zimbabwe (2008–2009) and

Haiti (2010)). Its ancestral home is in Bengal and it was first documented in 1817. In 2009, the most recent year with available data, 45 countries reported 221,226 cholera cases to the World Health Organization (WHO) [3].

This diarrheal disease is caused by *Vibrio cholerae* and its earliest record dates back to the 16th century. The global pandemics of “Asiatic cholera” was first documented in 1817. Cholera affected Europe for the first time in 1831 during the second cholera pandemic [4].

During the terrifying cholera epidemic of 1835–1836, Sardinia was the only Italian region that managed to escape, due to the surveillance of the armed men who had orders to prevent, even by force, if necessary, any attempt to disembark people on that coast [5].

The American military physicians implemented the first mandatory typhoid inoculation program, contributed to the progress made in water chlorination and they also pioneered the use of antibiotics in typhoid fever. Some U.S. Navy physicians practiced the intravenous treatment of cholera, reducing that way the mortality rate from 20% to less than 1%. The studies they made on electrolyte and fluid balance in cholera and also on oral rehydration therapy for cholera and other diarrheal illnesses, have certainly saved millions of lives worldwide [6].

Captain Robert Allan Phillips (1906-1976) established some effective, evidence-based rehydration methods in the treatment of patients with cholera. Being a Navy Lieutenant at the Rockefeller Institute for Medical Research (New York) during World War II, he managed to develop a method for the rapid assessment of fluid loss in wounded. Phillips embarked on cholera studies during the Egyptian cholera epidemic in 1947 and finished them at NAMRU-2 (1958-1965), elucidating the pathophysiologic disorders induced by this terrible illness. He talked about a theory of a simpler cholera treatment in the late 1960s – a glucose-based oral rehydration therapy, which was a monumental discovery, with vital contributions from others too. Nowadays, these simple achievements have been integrated into everyday medical practice and they save millions of lives annually [7].

Influenza pandemics have also caused major morbidity and mortality for centuries. In recent decades, the globalization has driven social and economic changes that have accelerated the spread of new viruses [8].

The American military experience in World War I and the influenza pandemic were closely connected. The virus “traveled” with military personnel across the Atlantic, all the way from the American military camps to the trenches in Europe’s Western Front. More American soldiers, sailors and Marines died of influenza and pneumonia than on the industrialized battlefields.

The Army Medicine mixed the old sanitation model of clean water and fresh air with the new public health measures of educating soldiers on how to prevent illnesses. The Army Surgeon General William C. Gorgas

pleaded for good food, clean water, fresh air, good personal hygiene and avoiding crowding.

When the Influenza epidemic exploded in August and September in Europe and U.S.A., the medical officers had to deal with an epidemic worse than any of them had ever seen.

By the 1910s, the doctors had many of the instruments to understand the nature and the extent of the influenza and pneumonia, but, unfortunately, lacked the tools to fight them. While virology would not develop until the 1930s, physicians could identify some bacteria causing the deadly pneumonias, but they couldn’t do much to fight the infections because they had no antibiotics.

In the old continent, influenza also attacked Allied and German armies, filling hospitals and transport trains with weak, feverish men. Influenza cases outnumbered war casualties and it killed more American soldiers than did the enemy artillery [2].

Pandemic influenza is a major challenge for all the health systems in the world. It requires preparation for a situation of widespread morbidity due to flu and its complications. This may require major involvement of the army in both preparedness and measures to be taken [9].

The army roles during pandemic outbreaks include: taking national and regional command of the event, use of logistic and military resources, assigning workforce for essential civilian missions, maintaining public order and implementing public health measures such as isolation and quarantine. Moreover, the army must continue its primary role of maintaining the security of the state [9].

In 1918–1919, in a world divided by war, the medical officers isolated the soldiers who had signs or symptoms, but the extremely contagious illness spread quickly, infecting persons in almost every country. The authorities tried some responses to the pandemic. In some big cities of the Western world there were implemented disease-containment strategies, including the closure of schools, theaters and churches or suspending any public gatherings [5].

In Sweden, the soldiers were severely affected by the pandemic in 1918 and the outbreaks often started in the garrisons. By the

end of 1919, approximately 38% of the soldiers had fallen ill (by the so-called Spanish flu).

During World War II, Sweden was neutral. According to the cause-of-death register in Sweden, 1941 was an extremely bad year for seasonal influenza [10].

An important number of soldiers got Asian flu in 1957, but the garrisons didn't play the same role as during the Spanish flu, because the military medical care and the isolation measures had much improved [10].

The 1918 H1N1 influenza pandemic was unprecedented, with rapid global spread and high mortality. The potential for an influenza pandemic still remains a constant public health threat. We must have in mind that a hundred years ago, there were no diagnostic tests available, no influenza vaccines and no antiviral medication. In addition, critical care measures, such as intensive care support or mechanical ventilators, were not available [11].

Since 1918, the world has experienced three subsequent pandemics. The estimated global mortality associated with these events was significantly lower, with approximately 1 million for the 1957 H2N2 and 1968 H3N2 pandemics and fewer than 0.3 million for the first year of the 2009 H1N1 pandemic [11].

Even these days, the old strategy of quarantine is still a powerful instrument of the public health response to infectious illnesses. During the 2003 severe acute respiratory syndrome (SARS) pandemic, the use of quarantine, border controls, contact tracing and surveillance proved to be effective in controlling the global threat in just about 3 months. Since March 2009, the influenza A/H1N1 virus spread worldwide, a fact that determined the WHO to declare another state of pandemic influenza [5].

The use of quarantine in order to control epidemic illnesses is controversial because such strategies raise socioeconomic, political and ethical issues. Moreover, it requires a careful

balance between public interest and individual rights [5].

Unfortunately, new viruses can abruptly change to become a more human-adapted virus, spreading efficiently from one person to another and causing significant morbidity and mortality worldwide, as SARS-CoV 2 recently did.

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