The Coming Influenza Pandemic: Lessons From the Past for the Future

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Fatality rates in diagnosed H5N1 victims are running about 50 percent. Even if that fell to 5 percent as the virus traded virulence for transmissibility among people, [Frederick G.] Hayden, [a University of Virginia virologist and an advisor to the World Health Organization] warns, “it would still represent a death rate double [that of] 1918, and that’s despite modern technologies like antibiotics and ventilators.”

—W. Wayt Gibbs and Christine Soares

This dire warning echoes those of the experts monitoring the spread of influenza strain A, the avian influenza virus H5N1, out of Asia and now into Europe. This virus has many characteristics similar to the H1N1 virus that was responsible for the disastrous 1917–1918 influenza epidemic that killed at least 40 million people around the world in approximately 6 months. The 1917–1918 epidemic began in Kansas as a milder form of the virus and spread with military troops to Europe during the First World War, when it mutated to a virulent form that then swept across the globe.

At present, H5N1 can only be spread easily from bird to bird or from birds to humans who have direct contact with birds or perhaps with bird droppings. However, there is a substantial probability that this avian virus will mutate again or that it will exchange genes with a more readily transmissible human influenza virus, beginning a new pandemic.

Although such a virus requires an incubation period of a few days before symptoms become severe, carriers are infectious during that time and are actively, though unwittingly, spreading the disease. With present-day air transportation, human carriers of the virus could literally be around the globe before their symptoms develop and the “bird flu” pandemic could spread worldwide in days, not months.

Given this scenario, the US government has made plans to respond to an outbreak through the US Department of Health and Human Service’s Pandemic Influenza Plan. This plan—which was released on November 3, 2005, and supersedes the Draft Pandemic Influenza Response and Preparedness Plan—provides guidelines to local, state, and national agencies as they prepare for a possible pandemic influenza outbreak. It is an appropriate and necessary guide that should be taken very seriously, here and abroad.

As the document notes, however, in the case of a true pandemic, hospital capacity may well be overwhelmed, and healthcare workers may themselves become ill.

Should the pandemic strike as some experts fear it will, nations around the globe could be thrown into chaos. In the United States, as in many other developed nations, we have a robust medical system, but how would such a crisis be managed by developing nations?

As we saw in the aftermath of Hurricane Katrina, care for victims of large-scale natural disasters often requires that many victims be provided with medical care outside of the hospital setting. Victims of a coming pandemic may find themselves placed in schools, armories, sporting arenas, and other sites capable of housing large numbers of people temporarily.

Unfortunately, no plan, at this time, can address exactly how to deal with the illness itself; that step will be left to the healthcare providers managing the crisis.

There have indeed been many medical and public health advances in the treatment of patients with influenza since 1918, however.

Annual influenza vaccinations and antiviral medications such as oseltamivir phosphate (Tamiflu) and zanamivir (Relenza) are somewhat effective against current strains of
human influenza viruses. Recent news reports indicate that oseltamivir is already being horded in case of an outbreak, but at best, it is estimated that available quantities of that medication are so limited that only a small percentage of the world population could be protected even if all known supplies of the drug were made available to counter a pandemic. To formulate and make an effective vaccine in any quantity for the new virus would take at least 6 months. By then, the pandemic would likely be over, with potentially millions of people dead.

A worldwide surveillance system of 88 nations and nine international organizations is operating under the guidance of the World Health Organization to warn national governments of outbreaks of influenza so that quarantine and other measures can be taken to stem the spread of a potential pandemic. However, surveillance measures are not particularly effective in many countries where governments are loath to report such outbreaks or where medical facilities are poor or nonexistent. Inadequate surveillance measures would allow a rapid spread of the virus to such large numbers of people that a pandemic could not be avoided.

The H1N1 virus of 1917–1918 did its damage by causing a greatly enhanced immune response in the lungs that essentially destroyed the lung tissue, slowly asphyxiating victims in their own secretions. In this respect, the virus was unlike the usual influenza virus. It also was most potent against people who had the best immune systems: those in early adulthood. In most influenza outbreaks, the very young and the very old are at greatest risk. However with H1N1 and H5N1, young adults are at greatest risk. This selective demographic targeting presents other social problems as the most productive members of the population would be the hardest hit.

The mechanisms by which the H1N1 and H5N1 viruses affect the body are currently under examination. The recent genetic reconstruction of H1N1 has allowed for such an analysis and has provided clues about the virulence of the viruses. It is evident that H1N1 and H5N1 are both unusual and highly lethal viruses that most severely affect humans with competent immune systems. However, in its present form, H5N1 appears to be the more deadly of the two to humans.

Currently, the annual average number of deaths from influenza in the United States is about 36,000. If a pandemic form of influenza occurs, the United States alone could easily see that death toll climb to 210,000, with several million other people requiring hospitalization. The nation’s healthcare system simply would not be able to keep pace with such a dramatic increase in demand for urgent medical care.

However, the lessons learned within the osteopathic medical profession as a result of the 1917–1918 pandemic could prove useful once again if...
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(or when) a new influenza pandemic occurs. As AOA editor in chief, Gilbert E. D’Alonzo, Jr, DO,10 noted in his 2004 editorial, “Influenza epidemic or pandemic? Time to roll up sleeves, vaccinate patients, and hone osteopathic manipulative skills,” influenza patients treated osteopathically during 1917–1918 had a 0.25% mortality rate, as compared to the national average of 6% (and 10% for pneumonia patients, compared with 33% to 75% for the national average).

Obviously, the data collected shortly after the 1917–1918 pandemic must be treated cautiously. However, even with a lack of absolute agent-specific diagnostic techniques, the symptoms of the pandemic influenza were very good markers for infection. And even if some incorrect diagnoses were made by both osteopathic and allopathic practitioners, the magnitude of treatment differences remains remarkable. So what was the osteopathic difference?

In 1918, C.P. McConnell, DO,11 reported that the most effective treatment during the influenza pandemic was begun early in the onset of symptoms (within the first 24 hours) and consisted of carefully applied muscular relaxation and, most importantly, relaxation of the deep and extensive contractions of the deep spinal musculature and mobilization of the spine. These treatments would be repeated two or three times early in the course of the infection, along with traditional supportive measures such as hydration. During later influenza epidemics, such as the 1928–1929 and the 1936–1937 outbreaks, various lymphatic pump treatments and more attention to the cervical and upper thoracic regions were added to this recommended treatment protocol.12 These treatments, individualized to each patient’s needs, were apparently the most commonly applied osteopathic medical procedures during the epidemics.

It seems possible that the mechanisms of action of these treatments were to diminish somatic inputs from contracted muscles that had further stimulated the already overactive sympathetic system. This hyperreactivity exacerbated the counterproductive and deadly immune response. During the later phases of infection, osteopathic manipulative treatment (OMT) likely enhanced lymphatic drainage and encouraged appropriate immune response.

While we have no controlled data on the effects of OMT on the pandemic influenza, several studies have shown the effects of OMT on somewhat related diseases. For example, Noll et al13 demonstrated that OMT given to elderly patients with pneumonia decreases medication use and hospital stay. More recently, Knott et al14 showed in a canine model that lymphatic treatment greatly increases lymph flow in the thoracic duct.

Whatever the mechanism, these beneficial outcomes have taught us a great deal about how the osteopathic medical profession might handle a coming pandemic. The treatments used back then can be used again and do not require patient hospitalization. These methods can also be taught to family members who can then treat stricken relatives around the clock as needed. They do not rely on the availability of potent, expensive, and often harmful (especially when one is in a weakened condition) medications. These treatments can be delivered by osteopathic medical students under the direction of a physician—a measure that would add significantly to the pool of trained healthcare providers available to assist the public in such an emergency. Perhaps most importantly, OMT is meant to improve function, enabling the body itself to better—and more appropriately—attack the disease, potentially extending its usefulness to combating whatever virus causes the next pandemic.

As noted, Dr Healy5 warns us that medicine in the United States may regress to its 1950s state in the next pandemic. Perhaps it should “regress” to a certain point—to take careful note of the state of treatment in 1917–1918 as used by the osteopathic medical profession. In fact, it may have to. The osteopathic medical profession can well be a potent force in the next influenza epidemic if it remembers the lessons of its heritage and has the courage to prepare itself to teach those lessons to others.

References


