H1N1 Experiences Point to Control Strategies

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FROM THE NEW ENGLAND JOURNAL OF MEDICINE

Strategies to control the spread of seasonal influenza outbreaks work to help curb influenza A(H1N1) outbreaks as well, suggest two studies conducted in Singapore and Hong Kong.

In the first report, standard containment strategies along with "ring chemoprophylaxis" were effective at controlling transmission of H1N1 in Singapore early in the course of the 2009 pandemic, according to Dr. Vernon J. Lee of the Singapore Ministry of Defense's Center for Health Services Research.

In a separate report on the early H1N1 experience in Hong Kong, researchers found that in community households, the virus showed traits that were broadly similar to those of seasonal influenza A in transmissibility, viral shedding, and clinical illness.

While these findings have implications for future outbreaks, they do not necessarily "inform the success of potential containment efforts implemented at the source of the next influenza pandemic or implemented to prevent the introduction of influenza into a community," Dr. Timothy M. Uyeki of the Centers for Disease Control and Prevention, Atlanta, pointed out in an editorial accompanying the two reports (N. Engl. J. Med. 2010; 362:2221-3).

Ring chemoprophylaxis entails containing a viral outbreak within a targeted geographic area surrounding an index case by administering a drug to everyone in the area.

In the first study, Dr. Lee and associates described early H1N1 outbreaks in four military camps, including one military hospital. This is one of the first studies to document the real-world effectiveness antiviral "ring chemoprophylaxis" in a pandemic, they said.

"Ring chemoprophylaxis" entails containing a viral outbreak within a targeted geographic area surrounding an index case by administering a drug—in this case, oseltamivir—to everyone in the area, not just to known, close contacts. In this study, all members of the affected military units, where opportunities for contact were substantial, were included in prophylaxis effort, even though they did not fulfill standard criteria as close contacts. Larger "rings" of prophylaxis were established if cases developed in multiple units.

All personnel suspected of being infected were isolated in the hospital if they tested positive. All asymptomatic personnel in the same unit were screened 3 times per week using nasopharyngeal swabs and PCR testing plus symptom questionnaires and monitoring of body temperature, until the outbreak subsided.

Such a strategy had the potential for intense transmission of the virus, similar to environments such as hospital wards, schools, and long-term care facilities. However, the "ring" approach based on spatial proximity brought an early halt to transmission, they noted.

Among a total of 1,175 personnel, a total of 82 confirmed cases of H1N1 virus were documented during the 4 outbreaks. Only 7 of these patients (0.6% of the study population) developed symptoms after the prophylaxis program had begun; the remaining 75 had been infected before the intervention was implemented. The overall infection rate was 5.9%.

By comparison, the rate of influenza infection was 57% in another study of Taiwanese military recruits, 42% aboard a U.S. Navy ship, 71% in a British boarding school, and 35% in a New York City school, Dr. Lee and his colleagues said (N. Engl. J. Med. 2010;362:2166-74).

"Our experience provides evidence that early case detection and the use of antiviral ring prophylaxis effectively truncate the spread of infection during an epidemic, giving empirical support to theoretical mathematical models," they said.

"Aggressive prophylaxis may be justifiable … to protect vulnerable populations such as frail or elderly residents of long-term care facilities or persons in closed or semiclosed environments such as schools, prisons, and military camps," Dr. Lee and his associates added.

In the second study, Benjamin J. Cowling, Ph.D., of the University of Hong Kong, and his associates assessed both H1N1 and seasonal flu transmission among 99 index patients and their 284 contacts in 99 households throughout the city at the beginning of the pandemic.

Clinical illness was similar between H1N1 and the seasonal flu. The incubation period was estimated to be 3.2 days for H1N1, very similar to the 3.4-day incubation period for the seasonal flu. Also similar was the duration of viral shedding, which was 5-7 days for both infections.

The secondary attack rate—the rate at which household contacts acquired the virus from index cases—also was similar between H1N1 and seasonal flu. However, the initial attack rate, meaning the rate at which index cases became infected, was much higher with H1N1 than with seasonal flu, as was reported worldwide.

"This difference in attack rates could be associated with the lack of preexisting immunity against the pandemic influenza virus, rather than an inherent difference in transmissibility" between H1N1 and seasonal flu, Dr. Cowling and his colleagues pointed out (N. Engl. J. Med. 2010;362:2175-84).

Overall, their findings suggest that H1N1 flu and seasonal flu viruses "are associated with similar viral-load dynamics, severity of clinical illness, and transmissibility," the investigators said. ■

Disclosures: *Dr. Lee's study was supported by the Singapore Ministry of Defense; the National University of Singapore; and the Singapore Agency for Science, Research, and Technology. Dr. Cowling's study was supported by the National Institute of Allergy and Infectious Diseases (U.S.) and Hong Kong University. Dr. Lee's associates reported ties to GlaxoSmithKline, Novartis, Adamas Pharmaceuticals, Baxter, MerLion Pharmaceuticals, Pfizer, and Wyeth.*