Public Health

Coping with flu season

Epidemiology

Influenza viruses belong to the Orthomyxoviridae family and consist of types A, B and C. Influenza A viruses are classified into subtypes on the basis of their 2 surface glycoproteins — hemagglutinin (H) mediates replication, while neuraminidase (N) promotes release of the virus. The name, such as A/Texas/36/91 (H1N1), identifies the type, location of isolation, number of isolates, year of recovery and subtype.[1] The surface glycoproteins are responsible for the changing antigenicity of influenza viruses. Antigenic drift refers to frequent, minor point mutations of the corresponding RNA segment. Antigenic shift occurs only in influenza viruses and results from the acquisition of new gene segments for hemagglutinin or neuraminidase.

Influenza A and B viruses annually cause outbreaks of illness in 10% to 15% of adults; rates are higher among children.[1] The appearance of a new strain for which most of the population lacks immunity can cause worldwide outbreaks, or pandemics, associated with rapid global spread and high attack rates among people in all susceptible ages. Five pandemics have occurred during the past 100 years, the most severe of which was the Spanish pandemic in 1918 and 1919, which caused more than 20 million deaths. In Hong Kong in 1997 influenza A (H5N1), which had been known to cause outbreaks only in birds, jumped the species barrier for unknown reasons, resulting in 18 confirmed cases and 6 deaths.[2] The World Health Organization (WHO) first implemented its pandemic guidelines during this outbreak to address issues such as surveillance, vaccine requirements and adverse event monitoring.

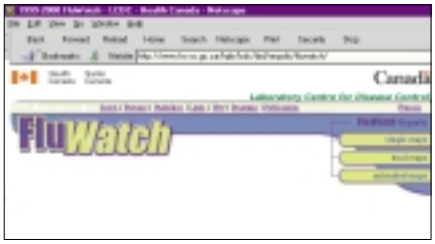
Clinical management

The incubation period for influenza averages 2 days. Classic influenza is distinguished by abrupt onset of prominent systemic symptoms, including fever, chills, headache, myalgia, malaise and anorexia. Fever usually lasts 3 days. Sore throat, sore eyes and photophobia are common early in the illness. As systemic illness abates, protracted cough becomes the most troubling respiratory symptom. Secondary bacterial pneumonia should be suspected when fever, increasing cough and sputum production develop after several days of improvement.

Oral amantadine, which appears to block viral assembly, reduces the duration of fever and symptoms of uncomplicated influenza virus infections by 1 to 2 days.[1] Limitations to its use include neurologic side effects such as insomnia and poor concentration, lack of activity against influenza B and development of viral resistance.[2] Recently, 2 neuraminidase inhibitors, zanamivir (Relenza) and oseltamivir (Tamiflu), were approved in Canada for the treatment of uncomplicated acute illness (symptom onset less than 2 days) caused by influenza A and B viruses.[3] Zanamivir is an inhaled antiviral drug for adults and adolescents aged 12 years and older. Recommended dosage is twice daily for 5 days using a breath-activated plastic inhaler.[4] The recommended dosage for oseltamivir is one 75-mg capsule taken twice daily for 5 days.[4]

Prevention

The only antiviral drug available in Canada for the chemoprophylaxis of influenza is amantadine. It is about 70% to 90% effective in preventing illness caused by influenza A virus and can provide several weeks' protection in people vaccinated after influenza A activity has begun.[1] The neuraminidase inhibitors have not been approved in Canada for influenza prophylaxis. However, according to a recent double-blind, randomized trial conducted over 6 weeks during the influenza season, 75 mg of oseltamivir administered once or twice daily was well tolerated and showed 74% efficacy against laboratory-documented febrile influenza.[5]



Vaccines are the principal means to attenuate the impact of an influenza epidemic or pandemic. Although the target groups for vaccination are those at increased risk for influenza-related complications, several studies have demonstrated the cost-effectiveness of influenza vaccination of healthy children[6] and the working-age population.[7] Vaccine composition is reviewed annually by WHO to reflect changing antigenicity. With today's egg-based manufacturing process, the first vaccine supplies would not be available for at least 3 months after a pandemic was identified. Ensuring a secure vaccine supply and the availability of antiviral drugs during a pandemic are key elements of the Canadian pandemic contingency plan.[2]

This article was written by Dr. Erica Weir, CMAJ's *Editorial Fellow.*

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