Session 1: Update on Virology and Pharmacology of Antiviral Agents

Anti-influenza Pharmacology

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Abstract

The World Health Organization (WHO) announced the worldwide pandemic infection of the novel H1N1 influenza virus as "2009 H1N1" on 11th June 2009. This virus originally called "swine flu" is a new strain of the influenza A virus that contains mixed segments of genes from pig, bird and human influenza viruses. Although vaccine is the primary need for the prevention of this virus, vaccine production would not be available immediately to prevent the first time of spread of a new strain of influenza virus. Vaccines are being deployed in some well-resourced countries but are not available globally. Antiviral drugs are thus an important strategy for specific protection of this pandemic outbreak. Two groups of antiviral drugs are generally use for the prophylaxis or treatment of influenza infections: the adamantanes (amantadine and rimantadine) and the neuraminidase (NA) inhibitors [oseltamivir (Tamiflu®) and zanamivir (Relenza®)].

Amantadine and rimantadine block viral uncoating in the infected cell. They are effective against influenza A and are associated with several side effects and with rapid emergence of drug-resistant variants. This potential for the development of resistance limits the use of these drugs for the treatment of influenza. They are not recommended for the prophylaxis or treatment of the 2009 H1N1 influenza virus.

The neuraminidase inhibitors oseltamivir and zanamivir interfere with the release of progeny influenza virus from infected host cells, a process that prevents infection of new host cells and thereby inhibits the spread of infection in the respiratory tract. These drugs are effective against all strains of influenza. They are advantage over the adamantanes, which are effective only against sensitive strains of influenza A. The neuraminidase inhibitors should be administered as early as possible, between 24 and 72 hours after the onset of the illness. They are associated with fewer side effects and are less likely to induce drug-resistant influenza than the amantanes.

At present, the 2009 H1N1 virus is susceptible to the NA inhibitors and resistant to the adamantanes. Antiviral treatment is recommended for all hospitalized patients with confirmed, probable, or suspected 2009 H1N1 infection and patients at high risk of complications. Treatment with these drugs is not recommended for low-risk patients with uncomplicated febrile illness. For the greatest benefits, treatment with the neuraminidase inhibitors should be started within 48 hours of the onset of the illness. However, there are evidences that hospitalized patients still benefit from treatment initiation even later. These drugs are use in the same doses and as for seasonal influenza.

Keywords: Anti-influenza, antiviral, H1N1