

Influenza Infection: Review Questions

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QUESTIONS

Choose the single best answer for each question.

- All of the following statements regarding antigenic variation of the influenza virus are correct EXCEPT:**
 - Antigenic shift results from genetic reassortment and results in marked changes in the hemagglutinin or neuraminidase antigens.
 - Antigenic variation occurs frequently in influenza A virus.
 - Antigenic drift refers to minor changes within an influenza subtype resulting from a mutation affecting the RNA segment coding for hemagglutinin or neuraminidase.
 - The occurrence of a herald wave at the end of a season predicts a pandemic.
 - Swine accepts both avian and human influenza viruses and is the likely intermediate source for genetic reassortment.
- All of the following statements regarding amantadine and rimantadine are correct EXCEPT:**
 - A dose reduction is recommended for persons 65 years of age or older.
 - The incidence of central nervous system side effects is higher among persons taking amantadine than among those taking rimantadine.
 - When amantadine or rimantadine is administered as chemoprophylaxis, vaccination is unnecessary.
 - Both drugs are 70% to 90% effective in preventing illness caused by naturally occurring strains of influenza A virus, but they do not prevent subclinical infection.
 - Amantadine-resistant viruses are usually cross-resistant to rimantadine and vice versa.
- All of the following statements regarding the neuraminidase inhibitors zanamivir and oseltamivir are correct EXCEPT:**
 - They are effective only against influenza A viruses.
 - They reduce the duration of illness when initiated within 48 hours of illness onset.
 - They are sialic acid analog inhibitors of neuraminidase.
 - They do not cause central nervous system side effects.
 - They do not impair the humoral immune response to infection.
- Each of the following conditions is a recognized complication of influenza virus infection EXCEPT:**
 - Influenza viral pneumonia
 - Gastroenteritis
 - Reye's syndrome
 - Secondary bacterial pneumonia
 - Croup
- During an influenza outbreak in your community, a 10-year-old child with a history of asthma presents to the clinic. The child has a 24-hour history of shortness of breath, a nonproductive cough, rhinorrhea, fever, and myalgias. Bronchodilators partially improved the child's breathing at home. All of the following are an appropriate part of acute management EXCEPT:**
 - Place on droplet precautions.
 - Initiate nebulized bronchodilator treatments.
 - Administer amantadine until 48 hours after symptoms have resolved.
 - Administer oxygen if oxygen saturation is low.
 - Administer aspirin for relief of fever.

(turn page for answers)

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EXPLANATION OF ANSWERS

1. **(D) The occurrence of a herald wave at the end of a season predicts a pandemic.** This statement is incorrect. The herald wave is merely the identification of a different antigenic form of the virus that appears near the end of an influenza season. There is an increased likelihood that this form will reappear during the next season; thus, it is usually selected as a candidate for the next year's vaccine.
2. **(C) When amantadine or rimantadine is administered as chemoprophylaxis, vaccination is unnecessary.** This statement is incorrect. Although the antiviral drugs reduce the possibility of clinical disease, they do not provide any lasting protection. As soon as the prophylaxis is discontinued, the patient is vulnerable to infection. Assuming that immediate protection is needed (ie, the patient was not vaccinated or is traveling to the Pacific area or the Southern Hemisphere), antivirals can be used to provide protection during the "window phase" of vaccination when antibodies are developing. The antivirals do not interfere with the immune response to the vaccine.
3. **(A) They are effective only against influenza A viruses.** This statement is incorrect. Unlike the first generation anti-influenza drugs (amantadine and rimantadine), the newer drugs have been shown to be effective against both A and B strains of the influenza virus. The reduced level of central nervous system side effects and the expanded spectrum of efficacy make these drugs very useful additions to a physician's armamentarium.

4. **(B) Gastroenteritis.** This statement is incorrect. Despite popular belief, there is no such disease as the "gastrointestinal flu." Influenza is a respiratory pathogen with no impact on the gastrointestinal system. Although the entire body may suffer the effects of influenza infection, neither vomiting nor diarrhea is associated with this virus. Unfortunately, there are gastrointestinal viruses that circulate during the same winter months as influenza. Neither the first generation of anti-influenza drugs nor the newer neuraminidase inhibitors provide any relief against non-influenza viruses.
5. **(E) Administer aspirin for relief of fever.** This statement is incorrect. Although the use of aspirin is appropriate for the relief of fever, this patient is a 10-year-old child. The use of aspirin in a child with influenza is contraindicated due to the association of aspirin usage in children with influenza and the development of Reye's syndrome. Reye's syndrome is more common with influenza B, but outbreaks have been found associated with influenza A. Public awareness is responsible for reducing the number of cases—from a high of 555 cases in 1980 to the current level of fewer than 37 cases yearly. The remaining cases may be due to self-medication by adolescents or the unknowing use of medications containing aspirin.¹

REFERENCE

1. Belay ED, Bresee JS, Holman RC, et al: Reye's syndrome in the United States from 1981 through 1997. *N Engl J Med* 1999;340:1377-1382.

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INFECTIOUS DISEASES

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