Tetanus, Diphtheria, Pertussis (7 Years and Older)

Traveler Summary

Key Points

- Diphtheria is a severe bacterial infection of the throat that occurs worldwide (especially in developing countries with poor vaccination coverage) and is acquired through inhalation of aerosolized respiratory droplets from infected persons. Pertussis (whooping cough) is a bacterial infection that occurs worldwide and is acquired through inhalation of aerosolized respiratory droplets or direct contact with respiratory secretions of infected persons. Tetanus (lockjaw) is a bacterial infection affecting the muscles that occurs worldwide and is acquired through the contamination of wounds or other breaks in the skin.
- Risk of diphtheria is increased for unvaccinated or inadequately vaccinated travelers going to affected countries, especially during outbreaks. Risk for pertussis is increased especially for incompletely vaccinated infants who come in close contact with infected persons. Risk of tetanus is increased in the case of severe injury or exposure to nonsterile instruments during surgical or dental procedures.
- Symptoms of diphtheria include sore and swollen throat ("bull-neck" appearance), hoarseness, nasal drainage, fever, difficulty swallowing, and a thick coating overlying the tonsils and throat. Symptoms of pertussis include severe unrelenting cough, which (in young children) is followed by sudden outbursts of a high-pitched "whoop" on inhalation. Symptoms of tetanus include spasms of the jaw muscles, painful stiffness in the neck and abdomen, difficulty swallowing, and muscle spasms throughout the body.
- Consequences of infections include fatal airway obstruction or heart failure with diphtheria; breathing difficulty (especially in infants) and seizures with pertussis; and death due to respiratory muscle spasms with tetanus.
- Prevention includes observing good respiratory hygiene (cough and sneeze etiquette), hand hygiene (frequent, thorough handwashing), and proper wound cleaning and care.
- Diphtheria, tetanus, and pertussis vaccines are routinely given to children as 4 doses through age 18 months, followed by a booster at age 4-6 years. Completely unvaccinated adults will need an entire 3-dose series.
- Vaccine side effects are most commonly injection-site reactions, headache, tiredness, and fever.
- Duration of vaccine protection varies for the different vaccine components. For adult travelers, a Tdap (tetanus, diphtheria, pertussis) booster is recommended every 10 years due to increasingly frequent pertussis outbreaks worldwide.
- Postexposure prevention of tetanus from a wound includes proper wound care and, possibly, a booster dose of a tetanus-containing vaccine.

Introduction

Diphtheria, an acute, contagious bacterial disease, occurs worldwide (especially in developing countries with insufficient vaccination coverage) and is transmitted mainly through inhalation of respiratory droplets of an infected person.

Pertussis, a highly contagious bacterial respiratory disease, occurs worldwide and is transmitted through inhalation of infected aerosolized respiratory droplets or direct contact with respiratory secretions from infected persons.

Tetanus, an acute (often fatal) bacterial disease, occurs worldwide and is transmitted mainly through contamination of open wounds, burns, punctures, or other breaks in the skin with bacteria from soil, dust, or surfaces.

Risk Areas

Diphtheria occurs worldwide (especially in tropical countries) but is uncommon in industrialized countries; highest incidence is in developing countries where vaccination coverage is low.

Pertussis is common worldwide, even in countries with robust vaccination programs where resurgence is probably due to waning protection from current pertussis-containing vaccines. Highest incidence is among young children in countries where vaccination coverage is low.

Tetanus is common worldwide (especially in countries with suboptimal vaccination programs), and highest incidence is in densely populated regions with warm, damp climates and rich, organic soil. The tetanus bacteria are widely distributed in the environment (including soil, dust, and animal and human feces) and can also be found in contaminated street drugs. In the US, tetanus is uncommon.

Transmission

Diphtheria is mainly transmitted from person to person via inhalation of aerosolized respiratory droplets (e.g., from coughs or sneezes) or close physical contact with discharge from skin ulcers (or material contaminated with skin discharge) of an infected person.

Pertussis is transmitted from person to person through inhalation of aerosolized respiratory droplets (e.g., from coughs or sneezes) or direct contact with respiratory secretions.

Tetanus is transmitted mainly through contamination of wounds, burns, punctures, or other breaks in the skin. Tetanus is not spread from person to person.

Risk Factors

Risk for diphtheria exists for unvaccinated or inadequately vaccinated travelers in developing countries and for tetanus and pertussis anywhere in the world. Travelers going to affected countries are at increased risk of diphtheria infection during outbreaks. Risk of pertussis infection is increased, especially for incompletely vaccinated infants who come in close contact with infected persons (e.g., older siblings, parents, or caregivers) who might not even know they have the disease. Risk for tetanus infection is increased for travelers exposed to nonsterile instruments during surgical or dental procedures and in rural or agricultural regions where contact with soil or animal excreta is likely.

Symptoms

Symptoms of diphtheria commonly appear about 2 to 5 days following exposure and include sore and swollen throat ("bull-neck" appearance), hoarseness, nasal drainage, fever, difficulty swallowing, and the presence of a thick coating in the throat (which can also occur in the nose).

Symptoms of pertussis appear about 7 to 10 days following exposure, beginning with mild upper respiratory symptoms, followed by severe coughing that progresses to sudden outbursts of a high-pitched "whoop" upon inspiration. Vomiting may occur, but fever is absent or minimal.

Symptoms of tetanus appear about 8 days after exposure and include spasms of the jaw muscles (lockjaw), painful stiffness in the neck and abdomen, and difficulty swallowing. Later symptoms include generalized, severe muscle spasms throughout the body.

Consequences of Infection

Fatal airway obstruction due to diphtheria can result if the coating extends into the voice box or windpipe, and cardiac problems may occur. Infants may develop seizures, breathing problems or respiratory failure due to severe cough associated with pertussis. Death from breathing failure occurs in approximately 10% to 90% of tetanus cases, with highest rates among infants and the elderly.

Need for Medical Assistance

Persons with symptoms of diphtheria, pertussis, or tetanus should seek immediate medical attention for evaluation of the need for postexposure treatment. Persons with diphtheria need to be referred to a center where specific antitoxin administration is available. Antibiotics can reduce the severity of pertussis infection and prevent transmission to close contacts. Tetanus infection requires hospitalization, antibiotics, immune globulin, and possibly anticonvulsants.

Prevention

Nonvaccine

Observe good respiratory hygiene (cough and sneeze etiquette), hand hygiene (frequent, thorough handwashing), and proper wound cleaning and care.

Vaccine

Diphtheria (D or d), acellular pertussis (aP or ap), and tetanus (T) containing-vaccines are routinely given as childhood vaccinations and to pregnant women and certain travelers. DTaP vaccine is used in young children, and Tdap vaccines (which contain a reduced amount of the diphtheria and pertussis components as denoted by the lower case "d" and "p" [compared to the DTaP vaccines]) are used for persons 7 years and older. All persons, regardless of travel plans, should have completed a primary series at some time during their lives and be up to date on regular booster doses.

Persons with underlying medical conditions or who have concerns about the vaccine should speak to their health care provider before vaccine administration.

Side Effects

The most common vaccine side effects for both Tdap and DTaP are injection-site reactions (pain, redness and swelling with or without tenderness). Headache, body ache, muscle weakness, and fatigue are common with Tdap, but fever is uncommon. Fever, drowsiness, poor appetite, and vomiting are common with DTaP.

Timing

DTaP vaccine is given as follows:

- Routine, regardless of travel for children younger than 7 years: 4 doses, 1 each at ages 2, 4, 6, and 15-18 months, followed by a booster dose at age 4-6 years prior to school entry.

Tdap vaccine is given as follows:

- Adolescents aged 11-12 years
- Adult travelers: booster every 10 years due to increasingly frequent pertussis outbreaks worldwide.
- Persons 7 years and older with an ***incomplete*** primary series of a tetanus-, diphtheria-, or pertussis-containing vaccine or unknown history of a pertussis-containing vaccine: 1 dose of Tdap followed by either Td or Tdap for subsequent doses if indicated.
- Persons 7 years and older ***without*** a prior primary series of a tetanus-, diphtheria-, or pertussis-containing vaccine or unknown history of a pertussis-containing vaccine: 3 doses (1 dose Tdap followed by 2 doses of either Td or Tdap), given as soon as possible; travelers should receive as many doses in the series as possible prior to travel.
- Persons aged ≥ 65 years: one-time dose
- Pregnant women (regardless of vaccination history): 1 dose of Tdap during each pregnancy (early in the third trimester is preferred). If not given during pregnancy, the dose should be given to the mother immediately after the baby is born.

Nontraveling adults and health care personnel who have previously received a dose of Tdap at any time (primary booster), and in whom it has been 10 years or more since the last dose of Tdap, may receive Tdap (unless contraindicated) or Td vaccine.

Travelers going to remote areas where tetanus boosters may not be readily available in case of an injury should receive a booster of Tdap (preferred for travelers) prior to travel if more than 5 years have elapsed since the last booster dose.

Travelers who received their last tetanus-containing vaccine 5 or more years earlier should receive 1 dose of Tdap or Td in the event of a severe or contaminated wound.

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