Meningococcal Meningitis

Traveler Summary

Key Points

- Meningococcal infections are acute, often fatal bacterial infections (caused by one of the bacterial serogroups A, B, C, W, X, and Y) occurring worldwide (mainly in the meningitis belt of sub-Saharan Africa) and transmitted through direct contact with airborne droplets from an infected person or carrier (without symptoms) or through contact with objects freshly soiled by their nasal secretions.
- Risk is generally low but is highest for travelers going to the meningitis belt and any other destination with a current local epidemic. Risk increases with the level of contact with the local population.
- Symptoms are usually severe and include high fever, rash, severe headache, vomiting, neck and back pain with stiffness, altered consciousness, and coma.
- Consequences of infection include deafness, difficulty concentrating and sleeping, or death (which may occur within 12-24 hours of initial symptoms).
- Prevention includes observing good respiratory hygiene (cough and sneeze etiquette) and hand hygiene (frequent, thorough handwashing).
- Meningococcal vaccines (protecting against different serogroups) are available. Quadrivalent (serogroups A, C, W, Y) meningococcal vaccine is given as a single dose to travelers at risk and given routinely to nontraveling adolescents at age 11 years and then again at age 16 years. At-risk travelers 2 months and older should receive 1 to 3 doses depending on age at series initiation. Meningococcal B vaccines (serogroup B) are not indicated for travel but are recommended for certain at-risk persons 10 years and older and may be used with clinical discretion for persons aged 16-23 years (preferred age 16-18 years).
- Vaccine side effects are mild and include injection-site reactions, headache, fatigue, muscle aches, weakness, and fever. Persons receiving quadrivalent vaccine may experience a painful swelling of the arm.
- Duration of quadrivalent vaccine protection wanes; a booster is recommended every 3 to 5 years if at continued risk.

Introduction

Meningococcal infections are potentially fatal, acute bacterial infections of the blood or brain occurring worldwide, caused by different serogroups (A, B, C, W, X, Y) of ***Neisseria meningitidis*** bacteria; the relative importance of these serogroups depends on factors such as age and geographic location. Most strains of the bacteria are nonharmful, but healthy adults carrying harmful strains are the main reservoir of infection. Transmission occurs through direct contact with airborne droplets from infected persons or carriers (without symptoms) or contact with objects freshly soiled by their nasal secretions.

Risk Areas

Meningococcal disease occurs worldwide but the highest incidence is in developing countries in the meningitis belt of sub-Saharan Africa, where large outbreaks (mainly caused by serogroups C, X, and W) occur semiannually in the hot dry season (November-June), mainly in children aged 5-14 years. In other developing countries, the seasonality is less marked.

In industrialized countries, the disease occurs as single cases or small clusters, with serogroup B being the most common cause, especially in children younger than 5 years. In countries with a temperate climate, peak transmission occurs during winter and spring and is more common in infants younger than 1 year and in young persons aged 10-20 years. Outbreaks may occur in crowded settings, childcare centers, schools, colleges, summer camps, and the military; serogroup B is the most common cause of outbreaks in the US. Outside the US, overall levels of serogroup C have decreased due to routine childhood vaccination in many countries. However, outbreaks still occur in countries that have not implemented meningococcal C (MenC) vaccination campaigns. Recently, several outbreaks of serogroup C meningococcal diseases have been reported among men who have sex with men.

Epidemics are associated with poverty and crowding. This pattern influences vaccination policy and advice to travelers.

Transmission

Meningococcal bacteria are mainly transmitted person to person through direct contact with airborne droplets from infected persons or carriers or through contact with objects that are freshly soiled by their nasal secretions. The closer the contact, the greater the risk of transmission. Humans are the only natural reservoirs of meningococcal bacteria, and approximately 10% of infected adolescents and adults are symptom-free carriers.

Risk Factors

Risk is generally low but is higher for travelers or health care workers (HCWs) going to (or residing in) countries within the African meningitis belt during the epidemic season or going to any country where an epidemic is ongoing or outbreaks are common; for persons participating in an international pilgrimage (Hajj or Umra); or persons having close contact with local residents who may be meningitis carriers. Congregate settings (e.g., military barracks, college dormitories/residence halls, and similar close-living quarters) facilitate transmission; smoke-filled bars and clubs have been associated with outbreaks. Outside the meningitis belt, infants have the highest rates of disease. Persons with certain medical conditions, underlying chronic disease, weakened immune systems, and recent respiratory infection (e.g., influenza) are also at increased risk.

Symptoms

Symptoms most commonly appear and progress rapidly about 3 to 4 days (range: 2-10 days) following exposure and include sudden onset of high fever and rash, followed hours or days later by severe headache, vomiting, neck and back pain with stiffness, altered consciousness, and coma. Half the persons with meningitis develop shock. In severe infections, a brief influenza-like illness with high fever leads directly to extreme weakness, collapse, and shock within hours.

Consequences of Infection

Nerve damage following infection is common. Deafness, loss of limb, and difficulty concentrating and sleeping may occur in persons who have recovered. Death occurs in more than 70% of untreated infected persons and in about 15% of individuals who receive treatment.

Need for Medical Assistance

Persons who have been exposed to or develop symptoms of meningococcal disease should seek immediate medical attention for evaluation of the need for postexposure treatment. Sudden onset of fever while in a risk situation, especially if accompanied by rash or headache, requires immediate medical attention. Antibiotic therapy, if given as soon as possible, may reduce the duration and severity of meningococcal meningitis.

Prevention

Nonvaccine

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

Vaccine

Routine

Quadrivalent meningococcal vaccines (Menactra, Menveo, and MenQuadfi), providing protection against serogroups A, C, W, and Y, are given routinely as an adolescent vaccination, to certain persons at risk, or to persons during a community outbreak caused by meningococcal serogroups A, C, W, or Y.

Meningococcal B vaccines (Bexsero, Trumenba), providing protection against serogroup B, are recommended for certain at-risk persons 10 years and older. These vaccines may be considered for short-term protection of healthy persons aged 16-23 years (preferred age 16-18 years) following shared clinical decision making between the patient and their health care provider.

Meningococcal C vaccine, providing protection against serogroup C (associated with school and community outbreaks in certain countries), is available outside the US and may be given following local guidance in the destination country.

Travel

Vaccination with quadrivalent (serogroups A, C, W, and Y) meningococcal vaccine is recommended for:

- Travelers going to (or residing in) certain countries where meningococcal disease is constantly or highly present or epidemic-prone at certain times of the year (dry season, December through June), especially if prolonged close contact with local residents is anticipated.
- Travelers going to any country experiencing a current epidemic or localized outbreak.
- HCWs traveling to any of the above countries at any time of year for health care work or research.
- Expatriates and long-stay child travelers in countries where meningococcal vaccine is given routinely to children and infants.
- Unvaccinated or undervaccinated first-year college students who will be living in dormitories or residence halls.
- Persons aged 11-18 years who have not previously received quadrivalent vaccine.

Vaccination with quadrivalent meningococcal vaccine is required for:

- All persons 2 years and older who are traveling to Saudi Arabia for the pilgrimage to Mecca (Hajj or Umra). Vaccination must have been received not more than 3 to 5 years (depending on vaccine) and not less than 10 days before arrival in Saudi Arabia.

Vaccination with meningococcal B (MenB) vaccine is recommended for expatriates and long-stay child travelers in a few countries (outside the US) where high risk exists for serogroup B; MenB vaccine is routinely given to infants/children in these countries. Vaccination is recommended for persons or HCWs going to areas with a serogroup B disease outbreak. Note: Children who have received only the MenB vaccine still need a quadrivalent vaccine if subsequent travel is planned to Africa or to Saudi Arabia for the Hajj.

Vaccination with meningococcal C vaccine (MenC; not available in the US) is recommended for expatriates and long-stay child travelers in countries where this vaccine is given routinely to infants/children.

Side Effects

The most common side effects of meningococcal vaccines are mild and include injection-site reactions (pain, redness, swelling, induration), headache, fatigue, muscle aches, weakness, and fever. Persons receiving quadrivalent vaccines may experience a painful swelling of the arm. Irritability, nausea, vomiting, loss of appetite, and diarrhea have also been reported, especially in infants and children.

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

Timing

Quadrivalent vaccines are given as follows:

- Routine, regardless of travel, Menveo, Menactra, or MenQuadfi are given to:
  - Adolescents aged 11-12 years: 1 dose followed by a booster at age 16 years
  - Military recruits (regardless of any previous doses); persons at risk from a meningococcal disease outbreak due to serogroups A, C, W, or Y; and microbiologists exposed to samples containing meningitis-causing bacteria: 1 dose followed by a booster every 5 years if risk remains
  - First-year college students (21 years or younger) living in residence halls: 1 booster dose (within 5 years of enrollment) if the most recent dose was given when younger than 16 years
- Travelers or other at-risk groups:
  - Children aged 2-23 months: 2 to 4 doses of Menveo (for children aged ≥ 2 months) or Menactra (for children aged ≥ 9 months) given 8 to 12 weeks apart (depending on age and vaccine brand). For imminent departures, doses may be given 4 to 8 weeks apart
  - Healthy persons 2 years and older: 1 dose of either Menveo, Menactra, or MenQuadfi
    - For persons younger than 7 years, boost 3 years after primary vaccination (due to waning immunity to serogroups A and C) and every 5 years thereafter if traveling to the African meningitis belt or to areas experiencing an outbreak outside of the meningitis belt.
    - For persons 7 years and older, boost 5 years (3 years if risk is increased) after primary vaccination (due to waning immunity to serogroups A and C) and every 5 years thereafter if traveling to the African meningitis belt or to areas experiencing an outbreak outside of the meningitis belt.

MenB vaccines (Bexsero or Trumenba) are given as follows:

- At-risk persons 10 years and older and during outbreak situations for all persons 10 years and older:

    - Bexsero: 2 doses, given 1 month apart
    - Trumenba: 3 doses; 1 each at 0, 1-2, and 6 months
    - A booster dose is given 1 year after completion of primary series and every 2 to 3 years after, if at continued risk
- Persons aged 16-23 years (preferred age 16-18 years) following shared clinical decision making:
    - Bexsero: 2 doses, given 1 month apart
    - Trumenba: 2 doses given 6 months apart
    - No booster dose is indicated.

MenC vaccine: Will be given following local guidance in destination country if needed.
