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Chapter 3
Infectious Diseases Related To Travel

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Poliomyelitis

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INFECTIOUS AGENT

Poliovirus (genus *Enterovirus*) types 1, 2, and 3. Polioviruses are small (27–30 nm), nonenveloped viruses with capsids enclosing a single-stranded, positive-sense RNA genome about 7,500 nucleotides long. Most of the properties of polioviruses are shared with the other enteroviruses.

TRANSMISSION

Fecal-oral or oral transmission. Acute infection involves the oropharynx, gastrointestinal tract, and occasionally the central nervous system.

EPIDEMIOLOGY

In the prevaccine era, infection with poliovirus was common worldwide, with seasonal peaks and epidemics in the summer and fall in temperate areas. The incidence of poliomyelitis in the United States declined rapidly after the licensure of inactivated polio vaccine (IPV) in 1955 and live oral polio vaccine (OPV) in the 1960s. The last cases of indigenously acquired polio in the United States occurred in 1979. The Global Polio Eradication Initiative (GPEI) subsequently eliminated polio in the Americas, where the last wild poliovirus (WPV)–associated polio case was detected in 1991. In January 2000, a change in vaccination policy in the United States from use of live OPV to exclusive use of IPV eliminated the 8–10 vaccine-associated paralytic poliomyelitis (VAPP) cases that had occurred annually since the introduction of OPV in the 1960s.

GPEI has built upon the success in the Americas and made great progress in eradicating WPVs, reducing the number of reported polio cases worldwide by more than 99% since the mid-1980s. As of March 2012, WPV circulation has never been interrupted in only 3 countries: Afghanistan, Nigeria, and Pakistan. In 3 African countries (Angola, Chad, and Democratic Republic of the Congo), WPV transmission has been reestablished after importations and outbreaks in 2008 and 2009. In spite of progress made in eradicating WPVs globally, countries are still at risk for imported cases. In 2010 and 2011, WPV outbreaks from importations occurred in 18 countries in Africa, Eastern Europe, and Asia.

Because of polio eradication efforts, the number of countries where travelers are at risk for polio has decreased dramatically. The last documented case of WPV-associated paralysis in a US

resident traveling abroad occurred in 1986 in a 29-year-old vaccinated adult who had been traveling in South and Southeast Asia. In 2005, an unvaccinated US adult traveling abroad acquired VAPP after contact with an infant recently vaccinated with OPV.

For additional information on the status of polio eradication efforts and vaccine recommendations, consult the travel notices on the CDC Travelers' Health website (/travel/) or the GPEI website (www.polioeradication.org (http://www.polioeradication.org) (http://www.cdc.gov/Other/disclaimer.html)).

CLINICAL PRESENTATION

Clinical manifestations of poliovirus infection range from asymptomatic (most infections) to symptomatic, including acute flaccid paralysis of a single limb to quadriplegia, respiratory failure, and rarely, death.

DIAGNOSIS

The diagnosis is made by identifying poliovirus in clinical specimens (usually stool) obtained from an acutely ill patient. Poliovirus may be detected by culture of cell lines followed by identification using neutralization tests or PCR. Poliovirus may also be identified by direct amplification from stool specimens followed by genomic sequencing to identify the possible source of the virus. Shedding in fecal specimens can be intermittent, but usually poliovirus can be detected for up to 4 weeks after onset of illness. During the first 3–10 days of the illness, poliovirus can also be detected from oropharyngeal specimens. Poliovirus is rarely detected in the blood or cerebrospinal fluid.

TREATMENT

Only treatment for symptoms is available, ranging from pain and fever relief to intubation and mechanical ventilation for patients with respiratory insufficiency.

PREVENTION

Vaccine

Recommendations for Health Protection

In the United States, infants and children should be vaccinated against polio as part of a routine immunization series (see Infants and Children below). Polio vaccination is recommended for all travelers to countries with wild poliovirus (WPV) circulation. Countries are considered to have WPV circulation if they have evidence during the previous 12 months of ongoing endemic circulation, a polio outbreak, or environmental evidence of wild poliovirus circulation. For additional information on countries with WPV circulation and vaccine recommendations, consult the travel notices on the CDC Travelers' Health website (www.cdc.gov/travel (http://www.cdc.gov/travel)) or the weekly update of reported WPV cases at the GPEI website (www.polioeradication.org/Dataandmonitoring/Poliothisweek.aspx (http://www.polioeradication.org/Dataandmonitoring/Poliothisweek.aspx) (http://www.cdc.gov/Other/disclaimer.html)).

Before traveling to areas that have WPV circulation, travelers should ensure that they have completed the recommended age-appropriate polio vaccine series and that adults have received a single lifetime IPV booster dose. In addition, CDC recommends a single lifetime IPV booster dose for certain adult travelers to some countries that border areas with WPV circulation. These

recommendations are based on evidence of historical cross-border transmission. The recommendations apply only to travelers with a high risk of exposure to someone with imported WPV infection. These travelers would include those working in health care settings, refugee camps, or other humanitarian aid settings. Since the situation is dynamic, refer to the CDC Travelers' Health website destination pages for the most up-to-date polio vaccine recommendations (wwwnc.cdc.gov/travel/destinations/list (/travel/destinations/list)).

To eliminate the risk for VAPP, IPV has been the only polio vaccine available in the United States since 2000; however, OPV continues to be used in many countries and for global polio eradication activities. For complete information on recommendations for poliomyelitis vaccination, consult the Advisory Committee on Immunization Practices recommendations website (www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/polio.html (http://www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/polio.html)).

Country Requirements

On May 5, 2014, the World Health Organization (WHO) declared the international spread of polio to be a public health emergency of international concern (PHEIC) under the authority of the International Health Regulations (2005) and issued temporary vaccination recommendations for travel to prevent further spread of the disease (www.who.int/mediacentre/news/statements/2014/polio-20140505/en/ (http://www.who.int/mediacentre/news/statements/2014/polio-20140505/en/) (http://www.cdc.gov/Other/disclaimer.html)). WHO will be reassessing the situation periodically, so requirements may change. Refer to the Clinical Update: Interim CDC Guidance for Travel to and from Countries Affected by the New Polio Vaccine Requirements (/travel/news-announcements/polio-guidance-new-requirements) for a list of affected countries and for guidance on meeting the vaccination requirements.

(Updated July 25, 2014)

Infants and Children

In the United States, all infants and children should receive 4 doses of IPV at ages 2, 4, and 6–18 months and 4–6 years. The final dose should be administered at age ≥4 years, regardless of the number of previous doses, and should be given ≥6 months after the previous dose. A fourth dose in the routine IPV series is not necessary if the third dose was administered at age ≥4 years and ≥6 months after the previous dose. If the routine series cannot be administered within the recommended intervals before protection is needed, the following alternatives are recommended:

- The first dose should be given to infants ≥6 weeks old.
- The second and third doses should be administered ≥4 weeks after the previous doses.
- The minimum interval between the third and fourth doses is 6 months.

If the age-appropriate series is not completed before departure, the remaining IPV doses to complete a full series should be administered when feasible, at the intervals recommended above, if the child remains at increased risk for poliovirus exposure.

Adults

Adults who are traveling to areas where poliomyelitis cases are still occurring and who are unvaccinated, incompletely vaccinated, or whose vaccination status is unknown should receive a series of 3 doses: 2 doses of IPV administered at an interval of 4–8 weeks; a third dose should be administered 6–12 months after the second. If 3 doses of IPV cannot be administered within the recommended intervals before protection is needed, the following alternatives are recommended:

- If >8 weeks is available before protection is needed, 3 doses of IPV should be administered ≥4

weeks apart.

- If <8 weeks but >4 weeks is available before protection is needed, 2 doses of IPV should be administered ≥4 weeks apart.
- If <4 weeks is available before protection is needed, a single dose of IPV is recommended.

If <3 doses are administered, the remaining IPV doses to complete a 3-dose series should be administered when feasible, at the intervals recommended above, if the person remains at increased risk for poliovirus exposure.

Adults who have completed a routine series of polio vaccine are considered to have lifelong immunity to poliomyelitis, but data are lacking. As a precaution, adults (≥18 years of age) who are traveling to areas where poliomyelitis cases are occurring and who have received a routine series with either IPV or OPV in childhood should receive another dose of IPV before departure. For adults, available data do not indicate the need for more than a single lifetime booster dose with IPV.

Vaccine Safety and Adverse Reactions

Minor local reactions (pain and redness) can occur after IPV administration. No serious adverse reactions to IPV have been documented. IPV should not be administered to people who have experienced a severe allergic reaction (such as anaphylaxis) after a previous dose of IPV or after receiving streptomycin, polymyxin B, or neomycin, which IPV contains in trace amounts; hypersensitivity reactions can occur after IPV administration among people sensitive to these 3 antibiotics.

Pregnancy and Breastfeeding

If a pregnant woman is unvaccinated or incompletely vaccinated and requires immediate protection against polio because of planned travel to a country or area where polio cases are occurring, IPV can be administered as recommended for adults. Breastfeeding is not a contraindication to administration of polio vaccine to an infant or mother.

Precautions and Contraindications

IPV may be administered to people with diarrhea. Minor upper respiratory illnesses with or without fever, mild to moderate local reactions to a previous dose of IPV, current antimicrobial therapy, and the convalescent phase of acute illness are not contraindications for vaccination.

Immunosuppression

IPV may be administered safely to immunocompromised travelers and their household contacts. Although a protective immune response cannot be ensured, IPV might confer some protection to the immunocompromised person. People with certain primary immunodeficiency diseases should not be given OPV and should avoid contact with excreted OPV virus (such as exposure to a child vaccinated with OPV in the previous 6 weeks); however, this situation no longer occurs in the United States unless a child receives OPV overseas.

CDC website: www.cdc.gov/vaccines/vpd-vac/polio (http://www.cdc.gov/vaccines/vpd-vac/polio)

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