

Poliomyelitis

The first outbreaks in Europe were reported in the early 19th century, and outbreaks were first reported in the United States in 1843. The last case of wild-virus polio acquired in the United States was in 1979.

According to the World Health Organization (WHO), 1 in 200 polio infections will result in permanent paralysis.

Poliovirus is a member of the enterovirus subgroup, RNA genome, family Picornaviridae. There are three poliovirus serotypes (P1, P2, and P3). The Global Polio Eradication Program has dramatically reduced poliovirus transmission throughout the world. In 2012, only 223 confirmed cases of polio were reported globally and polio was endemic only in three countries.

Reservoir

Humans are the reservoir of poliovirus, which is transmitted most frequently by persons with asymptomatic infections. There is no asymptomatic carrier state except in immune deficient persons. Children younger than 5 years old are more likely to contract the virus than any other group. The disease is via the fecal-oral route is the most important route of transmission and less frequently by a common vehicle (e.g. contaminated water or food).

Poliovirus infection typically peaks in the summer months in temperate climates.

Communicability

Poliovirus is highly infectious, Persons infected with poliovirus are most infectious from 7 to 10 days before and after the onset of symptoms, but poliovirus may be present in the stool from 3 to 6 weeks.

Clinical Features (Subclinical, non-paralytic polio (Abortive), polio paralysis)

Most infected children (72%) have no symptoms and usually go unrecognized (called subclinical polio). In others (non paralytic polio), initial symptoms include fever, fatigue, headache, vomiting, stiffness in the neck, meningitis and pain in the limbs. The incubation period for non-paralytic poliomyelitis is 3-6 days. In polio paralysis asymmetrical or could be both legs (more common), or both arms in paralytic poliomyelitis, the incubation period usually is 7 to 21 days. Irreversible paralysis. .

Less than 1% of polio infection cases can develop into paralytic polio. Paralytic polio leads to paralysis in the spinal cord (spinal polio), brainstem (bulbar polio), or both (bulbospinal polio). Initial symptoms are similar to non-paralytic polio.

But after a week, more severe symptoms will appear. These symptoms include:

- loss of reflexes
- severe spasms and muscle pain
- sudden paralysis, temporary or permanent
- deformed limbs, especially the hips, ankles, and feet

Post-polio Syndrome

After an interval of 15–40 years, 25%–40% of persons who contracted paralytic poliomyelitis in childhood experience new muscle pain and exacerbation of existing weakness, difficulty in breathing, sleep apnea, depression, or develop new weakness or paralysis.

Viral Isolation

Poliovirus may be recovered from the stool, pharynx, and only rarely recovered from cerebrospinal fluid (CSF) or blood. Reverse transcriptase - polymerase chain reaction (RT-PCR) or genomic sequencing, to determine if the virus is “wild type” or vaccine type.

Immunization

Overall, cases of polio have dropped by 99 percent. Only 74 cases were reported in 2015.

CDC vaccination schedule; 2m,4m,6m,4-6 years(booster).

Poliovirus Vaccines

almost always protects a child for life.

Inactivated (killed) polio vaccine (IPV) – protects against poliovirus types 1, 2, and 3

Trivalent oral polio vaccine (tOPV) – protects against poliovirus types 1, 2, and 3

Bivalent oral polio vaccine (bOPV) – protects against poliovirus types 1, and 3

Monovalent oral polio vaccines (mOPV1 and mOPV3) – protect against poliovirus type 1 and type 3, respectively.

Inactivated poliovirus vaccine:

Inactivated polio vaccine was first introduced in 1955 and is produced from wild-type poliovirus strains of each serotype that have been inactivated (killed) with formalin. As an injectable vaccine, it can be administered alone or in combination with other vaccines (e.g., diphtheria, tetanus, pertussis, hepatitis B, and haemophilus influenza).

Oral poliovirus vaccine: Trivalent OPV contains live attenuated strains of all three serotypes of poliovirus.

The vaccine is supplied as a single 0.5-ml dose.

IPV (killed salk): Advantage: safe, stable, not affected by other viruses

Disadvantage: expensive, low coverage of population

OPV (Sabin (oral live attenuated)

Advantage: easy administration, less expensive, more coverage of community

Disadvantage: cause paralytic polio, less stable, interfere by enteric viruses.

Contraindications & Precautions to Vaccination

- Severe allergic reaction (e.g. anaphylaxis) to a vaccine component
- Persons with a moderate or severe acute illness
- Breastfeeding does not interfere with successful immunization against poliomyelitis with IPV.
- IPV may be administered to a child with diarrhea.
- Minor upper respiratory illnesses with or without fever, mild to moderate local reactions to a prior dose of vaccine, current antimicrobial therapy, and the convalescent phase of an acute illness are not contraindications for vaccination with IPV.

Polio vaccine should be maintained at refrigerator temperature between (2°C and 8°C).

Vaccine-Associated Paralytic Poliomyelitis

Vaccine-associated paralytic polio is a rare adverse event following live oral poliovirus vaccine. The mechanism of VAPP is believed to be a mutation. Is more likely to occur in persons 18 years of age and older than in children
VDPV occurred at a rate of about 1 per 1.4 million vaccine doses, or 7-8 per year.

Control:

Individual:

- Personal hygiene, faecal and pharyngeal discharge disinfectant and disposed.
- Contacts protected with oral polio vaccine and put under observation for 3 weeks
- Tonsillectomy and dental extraction should be avoided if epidemic is present.

Community:

- Avoid crowding during epidemic
- Health education in raising standards of personal hygiene and education about vaccination.
- Rehabilitation for paralyzed patients.

Surveillance:

- Follow up any acute flaccid paralysis specially children under 15 years old.
- Two specimen from AFP cases (feaces sample during the 24-48 hours)