

Transmission Dynamics and Clinical Presentation of Polio

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ABOUT THE STUDY

Poliovirus, the causative agent of poliomyelitis, is a highly infectious virus belonging to the *Enterovirus* genus within the Picornaviridae family. It primarily targets the nervous system, causing severe neurological damage and potentially irreversible paralysis. There are three serotypes of Poliovirus (PV1, PV2, and PV3), with PV1 being the most common and virulent. Transmission occurs mainly through the faecal-oral route, thriving in areas with poor sanitation. Historically, polio has been a major public health threat, especially in the early to mid-20th century, leading to widespread fear due to its ability to cause sudden and severe paralysis.

Transmission and epidemiology

Poliovirus is primarily transmitted *via* the faecal-oral route, with the virus spreading through contaminated water, food, and hands. It can also spread, albeit less commonly, through oral-oral transmission *via* respiratory droplets. The virus is highly contagious, particularly in areas with poor sanitation and hygiene practices, where it can persist in the environment for extended periods. Epidemiologically, polio predominantly affects children under the age of five. The disease has a seasonal pattern, often peaking in the summer and autumn months in temperate climates. In endemic regions, the virus circulates year-round. The introduction of effective vaccines, such as the Inactivated Polio Vaccine (IPV) and Oral Polio Vaccine (OPV), has led to a dramatic decline in global polio cases.

Clinical manifestations

Poliomyelitis, commonly known as polio, manifests in a range of clinical presentations, from asymptomatic infection to severe paralysis. Approximately 90%-95% of poliovirus infections are asymptomatic, with the virus replicating in the intestines without causing noticeable illness. In about 4%-8% of cases, individuals may develop minor, non-specific symptoms such as fever, fatigue, headache, sore throat, and gastrointestinal disturbances, collectively termed abortive poliomyelitis. The most severe form, paralytic poliomyelitis, occurs in less than 1% of infections. It typically begins with symptoms similar to non-paralytic polio,

followed by severe muscle pain, weakness, and flaccid paralysis, usually asymmetric. Paralysis primarily affects the limbs but can also involve respiratory muscles, leading to potentially life-threatening complications such as respiratory failure.

Restorative approaches and supportive care

It is focus on managing symptoms and promoting recovery in affected individuals. Since there's no specific antiviral treatment for polio, treatment primarily involves supportive care to minimize symptoms and prevent complications. Medical interventions aim to reduce pain, fever, and manage respiratory difficulties, especially in severe cases affecting the respiratory muscles. Physical therapy is necessary for maintaining muscle strength, mobility, and preventing joint contractures or deformities in those with residual paralysis or weakness. Patients with severe respiratory involvement may require respiratory support, such as mechanical ventilation, to aid breathing until their respiratory function improves. Rehabilitation programs involve occupational therapy to improve daily living skills, while assistive devices like braces or wheelchairs aid mobility and independence. Psychological support and counseling are necessary to help individuals cope with disabilities and adjust to lifestyle changes resulting from polio. A multidisciplinary approach involving healthcare providers, therapists, and support networks is necessary to optimize quality of life and functional outcomes for those affected by poliovirus.

Post-polio health complications

Post-Polio Syndrome (PPS) is characterized by a range of health complications that arise decades after recovering from poliomyelitis. Muscle weakness is a primary symptom, affecting previously affected muscles and those that compensated during the initial infection. Fatigue is persistent and can be debilitating, impacting daily life. Pain in muscles and joints often occurs due to overuse and strain from compensatory movements. Respiratory and swallowing issues may develop, with weakening of respiratory and swallowing muscles causing breathing and swallowing difficulties. Orthopedic problems like joint degeneration, scoliosis, and muscle contractures can arise due to uneven stress on the skeletal system. Individuals with post-polio

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syndrome face an increased risk of falls and injuries due to muscle weakness and instability. Managing post-polio syndrome involves a multidisciplinary approach focusing on symptom management, physical therapy to maintain muscle strength, and

the use of assistive devices. Lifestyle adjustments are important to improving quality of life and minimizing the impact of these complications.