

Poliomyelitis: Infection, Types and Prevention

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INTRODUCTION

Poliomyelitis is a contagious disease caused by the Poliovirus which affects the central nervous system. This results in paralysis by muscle weakening. Most of the people affected by poliovirus show no symptoms, whereas few people have symptoms such as fever, nausea, constipation and respiratory infection. Some people may show post-polio syndrome after recovery.

Polio is caused by spreading through food or contaminated water with human feces. It may be diagnosed by finding antibodies which are against the virus in the blood. Based on the position of paralysis, paralytic Poliomyelitis is of following: Spinal, Bulbospinal. An infection of brain tissue occurs in infants known as Encephalitis. It causes headache, seizures, fever. The incubation time of the virus mostly is of three to one month. This is restricted to humans alone. Distinct variations of Poliovirus are present: PV1, PV2 and PV3 type among which PV1 is most common. This can be prevented by Polio vaccine. Person infected with the vaccine develop immunity against the Poliomyelitis virus. An IgA antibody acts against the virus and forbids the further replication. These are present in tonsils and gastrointestinal tract. Ig G and Ig M block the virus spread to the central nervous system.

Poliovirus infects human cells by binding to a receptor such as immunoglobulin, CD155 on the cell surface. The interaction of poliovirus with CD155 facilitates a consistent change in the synchronization of the viral particle required for viral implantation. Following attachment to the host cell membrane, viral nucleic acid infiltration was thought to occur in one of two ways: by pore formation in the plasma membrane where RNA was "inserted" into the cell cytoplasm, or by viral retrieval by receptor endocytosis. Recent experimental evidence supports the latter view and suggests that poliovirus binds to CD155 and is

susceptible to endocytosis. Immediately after insertion into the particles, the viral RNA is released.

Vaccine containing one distinct variation of the virus does not provide complete immunity against other types. A person needs to be exposed to all the variations (PV1, PV2 and PV3) of the virus to attain immunity. This infection is mostly caused due to nutrition deficiency, low immunity, injury caused to skeletal muscles. When the virus passes through nerve fibre, it replicates and harms the neurons in the spinal cord, cortex and brain. This leads to paralysis. Symptoms of Polio includes muscle pain, irritability and stiffness in back and neck, loss of reflexes. By isolating the virus through genetic fingerprinting or PCR amplification, paralytic Polio can be diagnosed. This can be prevented by passive immunization, Vaccination. Gamma globulin contains the antibodies which can prevent the disease and decrease the infection severity. Vaccination is of two types: attenuated and inactivated Poliovirus vaccine. Immunity against all three types (PV1, PV2 and PV3) is developed in inactivated poliovirus vaccine. Polio has no cure. Treatments such as orthopedic surgery, nutritious diet, antibiotics for muscle weakness, physical therapy are provided. Most cases involve temporary paralysis. Patients are recovered by 6-8 months. Non-steroidal anti-inflammatory drug are used for the treatment of the Polio.

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CONFLICT OF INTEREST

The author has declared that no competing interests exist.

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