

Acute anterior poliomyelitis

Acute anterior poliomyelitis, also known as **poliomyelitis** or **Heine-Medin disease**, is an epidemic summer virus. It is caused by non-enveloped ssRNA Poliovirus from the genus **enteroviruses** (*Picornaviridae*). *Poliovirus* has 3 antigen types without cross-immunity.

⚠ Attention! Not to be confused with cerebral palsy!

Due to the fact that *acute anterior poliomyelitis* is already eradicated in the Czech Republic, it is possible to encounter so-called *polio-like syndromes* or poliomyelitis acquired abroad. *Polio-like syndromes* are manifested by peripheral paresis and muscle atrophy in the area of one or two joints. Sensory disorders are not present, but pain may occur. EMG shows signs of an acute motoneuron lesion.^[1]



Incidence of poliomyelitis in the world, WHO, August 2015

Characteristics

The course of the disease is often silent and is limited to the gastrointestinal tract - water and food can be contaminated in this way. It is transmitted through the patient's stool. It selectively affects **the anterior horns of the spinal cord** and **motor nuclei of the trunk**. It has the same clinical picture as *echoviruses* and *Coxsackie viruses*.

Epidemiology

The incidence in the Czech Republic has been zero since 1957 (we are the first country in the world to do so). *Poliovirus* has **3 antigenic types - I, II, III** and human is the only natural host of the virus. Only in small percentage viremia and CNS intrusion occur.

Eradication^[2]

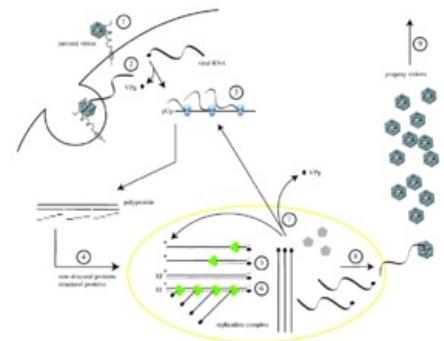
We divide regions into:

- **endemic**: Afghanistan, Nigeria, Pakistan,
- and **non-endemic**: Central African Republic, Chad, Ivory Coast, Democratic Republic of Congo, Ethiopia, Israel, West Bank, Gaza Strip, Kenya, Liberia, Mali, Niger, Somalia, Uganda.^[3]

The European region was declared poliomyelitis free in June 2005. There is still a risk of poliomyelitis imports.

WHO polio eradication program^[4]

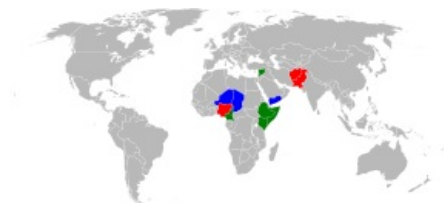
- Virological examination of patients with weak paresis.
- Examination of contacts.
- Mandatory reporting of cases.
- Professional analysis of isolates.



Poliovirus - life cycle

Pathology

Infiltration of lymphocytes and granulocytes around the stem motor nuclei and the cells of anterior horns of the spinal cord. **Microglia proliferation**.



Enlargement in the world (2013)

Clinical signs

Incubation period: **5-14 days**^[5] **Flu-symptomes** appear – fatigue, fever, sweating, headache, indigestion. **Healing** follows.

Only a fraction progresses to meningitis → headache, back pain, limbs, meningeal symptomes, muscle stiffness = **preparalytic stage** (or also meningeal). It progresses in the nervous system in about 2% = **paralytic stage**.

The course is most often **asymptomatic**. All stages leave **immunity** to the virus. The elimination it in the stool (3 months after the infection has subsided) helps to spread the virus.

Spinal form

It affects the **anterior** (sometimes lateral) corners of the spinal cord. Muscle fasciculations and pain occur. Paresis and vegetative manifestations develop within 24 hours. It can also affect the respiratory muscles.

Tribal form

It leads to paresis of the muscles of the pharynx, larynx, tongue, and facial expressions with possible spread to the respiratory muscles and to the heart. The improvement occurs one week after the development of nerve symptoms and continues within 1 year. It leaves **serious lasting consequences**. Residual peripheral paresis affecting various muscle groups of the limbs and torso, muscle contractures.

Complications

In acute stage: myocarditis, uroinfections, bronchopneumonia. In later stages: postpoliomyelitic syndrome.

Diagnosis

- Clinical picture + cerebrospinal fluid examination (cytoprotein association).
- Faecal isolation of faeces, rise of specific antibodies in cerebrospinal fluid and serum (confirmation of diagnostics).

Differential diagnostics

Other acute meningitis, polyradiculoneuritis, transverse myelitis.

Treatment and prevention

In the acute phase of the disease, physical **rest** and **drinking** are most important. Intensive care (ALV – mainly vacuum ventilation, using the so-called iron lung, artificial lung ventilation) is needed for severe forms (ascending Landry polio). It is a continuous long-term process. Interdisciplinary medical cooperation is important, as is cooperation with parents.

Prevention

Mortality reached up to 25% in the epidemic, the last in our country in 1960. A fundamental change was brought about by the introduction of active immunization in 1957, when vaccination with an **inactivated vaccine (Salk)** began. Since 1960, there has been vaccinated with a **live oral vaccine (Sabin)**.

Since 2007, based on WHO recommendations, the Czech Republic has started vaccinating again with an **inactivated** vaccine, which is administered as part of a **hexavaccine** or as a **monovaccine** in five doses. The reason for switching to an inactivated vaccine is the fact that its use does not result in faecal excretion or virus mutations, so there is no risk of post-vaccination poliomyelitis.^[6]

Prognosis

Good for all forms except paralytic. The lethality of the paralytic form is **5-15%**, and the survivors no longer recover. Unusual fatigue, joint and muscle pain, further muscle weakness, probably due to overloading of functioning muscle groups.

Preference is given to placing the child in a normal group. Another option is the Jedlička Institute in Prague.

Postpoliomyelitis syndrome

Usually **20 years of rest** after stabilization of the clinical residue after the *paralytic form* of poliomyelitis. The cause is **overload and dysfunction** of the remaining motoneurons of the anterior horns.

Symptoms: increased fatigue, muscle weakness (even in previously unaffected segments), fasciculations, pain in the affected muscles and joints.

Therapy: non-specific, includes supportive orthoses and gentle rehabilitation.

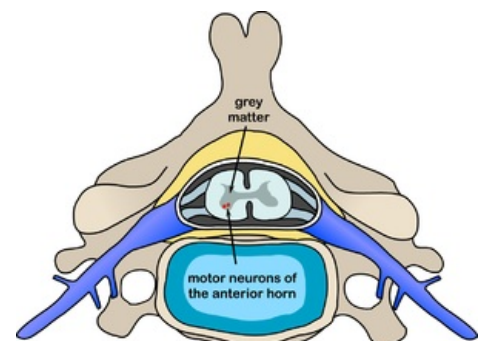
Links

Related articles

- Viral infections of the nervous system
- The most common syndromes and diseases of pediatric neurology / PGS
- Cerebral palsy
- The last journey of the polio virus (<https://jsme.cz/posledni-cesta-viru-detske-obrny>)



A man who has suffered from polio



Motoneurons of the anterior horns of the spinal cord

External links

- Infantile paralysis
- Polio (English Wikipedia)

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