Suppurative meningitis

Suppurative meningitis is an acute, life-threatening disease. It is caused by a number of bacteria that invade the meninges. 95% of suppurative meningitis is caused by meningococci, pneumococci and Haemophilus influenzae type b (Hib).

In new-borns and infants up to 2 months of age, the most common causative agents of purulent meningitis are streptococci, Echerichia coli, Listeria monocytogenes, enterococci and gram-negative enteric bacilli. Staphylococcus aureus causes meningitis, especially after brain surgery, after head trauma and in the setting of staphylococcal sepsis. Similarly, meningitis is caused by Pseudomonas aeruginosa. However, other bacteria can also be the causative agents in patients with compromised immune systems.

Transmission

The source of infection is a human (patient or vector-borne).

Disease transmission is by droplets, airborne, indirect or direct. Bacteria are released into the air when people talk, cough or sneeze; this can lead to direct infection or to the introduction of bacteria into the body via contaminated objects.

Epidemiology

Suppurative meningitis occurs sporadically around the world, and meningococcal meningitis occasionally occurs epidemically.

Hib is the most common cause of suppurative meningitis in children aged 1 month to 2 years. Most cases occur in the autumn and winter months. In 80% of children and adults, the bacterium is found in the pharynx and nasopharynx at certain times, but carriage in healthy adults occurs in only 3–5% of people. The use of the Hib vaccine has significantly reduced the incidence of invasive Hib infections in Western Europe and the USA. Since 2000, Slovenia has also introduced compulsory vaccination of children against Hib; before the introduction of vaccination, an average of 10 cases of Hib meningitis per year were reported in Slovenia, but since the introduction of vaccination, Hib meningitis is no longer reported in children.

Meningococcal meningitis occurs sporadically and in epidemics. In recent years, epidemics have occurred in Brazil, countries of the former Soviet Union, Norway, Belgium, New Zealand and the UK. In some areas of China, the Middle East, South America and especially sub-Saharan Africa, major epidemics occur every 10 years. In areas where meningococcal meningitis has been epidemic in recent years, the highest incidence has been in the 5–19 age group, with children aged 1–4 years being the most affected. In Slovenia, 10–20 patients a year are reported; the disease occurs most often in the winter and spring months.

Meningococcal carriage has been found in 1–15% of healthy people. Carriage can be chronic, intermittent or transient. A high percentage of patients' family members have been found to be carriers.

Pneumococci are the most common causative agents of suppurative meningitis in adults. In countries where Hib vaccination is routinely given, pneumococcus is becoming an increasingly important cause of suppurative meningitis in children. Nasopharyngeal carriage of pneumococcus is found in varying percentages; in 25–50% of children, 97% of adolescents and 5% of adults.

The course of the disease

Purulent meningitis is a very serious disease. Initial problems can be mild and uncharacteristic, depending on the age of the patient and the duration of the disease. Problems are particularly unusual in new born babies. The illness usually starts with fever, chills, headache, light disturbance, nausea, vomiting and numbness of the neck. In meningococcal meningitis, lesions appear on the skin, most often as tiny haemorrhages. Patients become restless, irritable, confused. The course of the disease is extremely rapid, and disturbances of consciousness can occur early, within a few hours of onset. Patients are severely affected and convulsions may occur. During the course of suppurative meningitis, there may also be inflammation of the joints, subcutaneous tissue, otitis media, pneumonia, vasculitis, pericarditis and post-peritoneal inflammation.

Diagnosis

The disease requires rapid recognition based on the clinical picture and laboratory examination of cerebrospinal fluid (CSF). However, isolation of the bacterium is often unsuccessful in patients who have previously been treated with antibiotics.

Treatment

The disease is treated in hospital with antibiotics.

Prevention

The most effective and safest way to prevent meningitis is through vaccination, but there are no vaccines available for all pathogens.

In Slovenia, haemophilus meningitis vaccination is compulsory for all children up to 5 years of age. It is also recommended for people who have a compromised immune system.

There is also a vaccine against meningococcal meningitis, but it is only effective against certain groups of bacteria. Vaccination is available for people aged 2 months and older. Vaccination is compulsory for pilgrims to Mecca.

Pneumococcal meningitis is also preventable by vaccination.

In people who have been in contact with a patient with suppurative meningitis caused by N. meningitidis or H. influenzae type b, infection and the onset of disease are prevented by prophylactic antibiotic treatment.