

Yellow fever

Causes and symptoms

What are the causes of yellow fever?

Yellow fever (ochropyra, yellow jack, black vomit) is an acute, anguishing infectious disease caused by the yellow fever virus. The causative agent belongs to the family of Flaviviridae. It is transmitted by various mosquitoes of the Aedes family but also by ticks. The yellow fever virus does not only affect humans but animals as well. A transmission from human to human is not possible.

The virus enters the body via the mosquito bite. It affects unspecific cells of the immune system (macrophages) in liver, spleen, lymph nodes and bone marrow. There, the virus multiplies and is released into the bloodstream. Yellow fever is divided into three types according to the mode of transmission:

1. **Urban yellow fever:** The infection cycles between human and mosquito. The mosquitoes acquire the virus by biting. After multiplying within the mosquito's organism, it is transmitted to another human with the next bite. This mode of transmission is most common in settlements and may cause epidemics.
2. **Sylvatic yellow fever:** The infection cycles between monkeys and mosquitoes. Humans are rarely infected. The disease occurs in the jungle and is appropriately termed jungle or bush fever.
3. **Intermediary yellow fever:** The mosquito acquires the yellow fever virus by biting a monkey and transmits it to a human. The disease occurs in settlements in the vicinity of forests, where man and monkey live in close proximity.

Typical regions of infections with yellow fever are Africa and South America. The African yellow fever zone extends from 15° latitude north to 10° latitude south. This zone includes 33 countries inhabited by 468 million people. In South America the area extends from 20° latitude north to 25° latitude south. Worldwide, a number of 200.000 illnesses and 30.000 deaths per year is estimated.

How does yellow fever manifest itself?

Sometimes, yellow fever can take a very mild course or show no symptoms at all. Children are frequently spared. The incubation time is three to six days. Usually, the disease consists of two stages, which lead to a third stage in 15 percent of the cases:

1. **Initial stage:** A sudden rise of fever up to 40°C is accompanied by shivering, severe headache, muscle soreness, nausea, vomiting and slow beating of the heart (bradycardia). Conjunctivitis may also sometimes appear. The initial stage lasts about three days.
2. **Stage of remission:** The fever declines on the third or fourth day and the patient can recover. In case of a severe course of disease the fever rises again leading to the third stage of intoxication.
3. **Stage of intoxication:** Liver and kidneys are mainly affected. An inflammation of the liver (hepatitis) with jaundice (icterus) may develop. If the yellow fever virus affects the kidneys this may lead to kidney failure. This stage often goes along with bleedings from skin, mucous membranes, and internal organs.

Diagnosis and treatment

How is yellow fever diagnosed?

Typical complaints, a journey to the tropics, and a physical examination usually suffice to diagnose yellow fever. The doctor can verify their diagnosis by having the virus or the antibodies detected with a blood analysis.

How is yellow fever treated?

Patients suspected of having contracted yellow fever as well as any contact persons without vaccination have to be isolated in mosquito-safe rooms. Only the respective complaints can be treated if the suspicion is substantiated. There is no specific therapy available at this point. If the yellow fever has reached stage three of intoxication intensive care medicine is required.

Prognosis and prevention

How is the prognosis of yellow fever?

In case of a fortunate course of disease yellow fever heals entirely within a short time. The disease takes a very mild, flu-like course if children under 14 years of age contract yellow fever. The mortality rate of adults is between ten and 20 percent and may be as high as 85 percent if the virus affects internal organs. Surviving an infection provides long, sometimes lifelong protection.

How to prevent yellow fever?

Yellow fever may be prevented by vaccination. The serum of live but attenuated yellow fever viruses is well tolerated. Vaccination is recommended to all travellers going to regions of high risk. Effective protection begins ten days after vaccination, which has to be planned accordingly prior to the journey. Protection lasts ten years. The vaccination can be applied in accredited yellow fever vaccination centres only.

General preventive measures consist of avoiding mosquito bites by adequate clothing, mosquito nets and mosquito repellents. Note that the mosquitoes transmitting yellow fever are active during day and night alike.

More information about yellow fever

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