

Dengue

Dengue is a mosquito-borne viral fever. It occurs in tropical and subtropical parts of the world, mainly in urban areas of Africa, Central and South America, Southeast Asia, the eastern Mediterranean and the western Pacific.

In recent years, isolated indigenous dengue cases have been recorded in France, Croatia and the Portuguese island of Madeira. The disease usually occurs during the rainy season, or in summer and autumn. Dengue does not occur in Slovenia. Slovenian citizens have contracted the dengue virus while travelling or staying in tropical places.

The cause

Dengue is caused by the dengue virus, a member of the flavivirus family. There are four types of dengue virus (DEN1, DEN2, DEN3 and DEN4).

Incubation period

The time from infection to disease onset is 3 to 14 days (most commonly 4 to 7 days).

Transmission

Dengue virus is transmitted to humans by the sting of an infected *Aedes* mosquito, most commonly *Aedes aegypti*, but also *Aedes albopictus* (tiger mosquito). The mosquito becomes infected when it bites a dengue patient and can transmit the disease to another person after 8 to 10 days. Direct human-to-human transmission of dengue virus is not possible. *Aedes* mosquitoes bite during the day but are most active in the early morning and towards evening. In extremely rare cases, the infection can be transmitted from an infected donor to a transfusion recipient through a blood donation or an organ transplant. Mother-to-foetus transmission is also possible.

People infected with dengue virus can transmit the infection to a mosquito within the first 5 days or up to 12 days after the first symptoms appear. The mosquito becomes infectious 8–10 days after infection and remains infectious for its entire lifetime, which is about a month.

Susceptibility to infection

Anyone who comes into contact with a particular type of dengue virus for the first time in the life is susceptible to dengue virus infection. Travellers to endemic areas where the disease is present are particularly at risk of infection. After a dengue infection, we develop immunity, which protects us against reinfection with the same type of dengue virus, but not against infection with the other three types of dengue virus. The risk of developing a severe form of the disease (dengue haemorrhagic fever) is even increased when re-infected with another type of dengue virus.

Symptoms

Dengue virus infection is most often (i.e. in 75% of cases) asymptomatic. When symptoms occur, the illness is most often flu-like. The main symptoms and signs are high fever, severe headache, pain behind the eyes, muscle and joint pains, and a rash. Mild bleeding (e.g. from the nose or gums and bruising of the skin) may also occur. Usually, young children and people with a first dengue infection have a milder course than older children and adults.

In 5% of infected persons, the disease can progress to a severe form of the disease, dengue haemorrhagic fever or dengue shock syndrome, which can be life-threatening. This form of the disease is characterised by a period of high fever and signs of general malaise lasting from 2 to 7 days, followed first by a drop in fever. This is followed by persistent vomiting, severe abdominal pain and breathing difficulties. There is an increased tendency to haemorrhage, manifested as bruising, bleeding from the nose and gums and, in some cases, internal bleeding. These symptoms and signs mark the beginning of a critical period lasting 24 to 48 hours, during which the permeability of the small blood vessels (capillaries) is increased, leading to leakage of fluid from the circulatory system into the surrounding tissues. This can lead to a state of shock, characterized by a drop in blood pressure and impaired blood supply to vital organs. If the condition is left untreated, death can occur.

Treatment

There is no specific treatment for dengue. A visit to the doctor, res, sufficient fluid intake and, if necessary, analgesics with paracetamol are recommended. Aspirin (or acetylsalicylic acid) is advised against, also because of its effects on blood coagulation.

If the patient feels worse in the first 24 hours after the fever has fallen, they should seek immediate medical attention as this may be a severe form of the disease (dengue haemorrhagic fever), which requires hospital treatment. Timely treatment of severe disease can reduce mortality from just over 20% to less than 1%.

Prevention of infection

Disease prevention is based on measures to reduce the risk of mosquito bites, especially at times when the dengue-carrying mosquito species (*Aedes*) is most active (early morning, late afternoon and evening). The dengue vaccine, which is also designed to protect travellers, is not yet available in Slovenia, but is available in some other European countries. Vaccination is most advisable before re-travel to areas at risk of dengue virus infection for persons who have already been infected with one of the four dengue serotypes, in order to prevent re-infection, which may be more severe. The benefit of vaccination is lower in travellers who have not previously been infected with dengue virus (for whom vaccination does not offer protection against DENV3 and DENV4 serotypes). The vaccine is licensed for use in people aged between 4 and 60 years. Vaccination consists of two doses of the vaccine at least 3 months apart. Protection is established 14 days after receipt of the first dose of vaccine.

All travellers to endemic areas or countries with dengue outbreaks are advised to minimise their exposure to mosquitoes and to take the following precautions:

- Wearing long-sleeved and trouser-length clothing, especially during peak mosquito activity (morning and evening).

- Using repellents (mosquito repellents) containing 20–30% DEET (N,N-diethyl-m-toluamide). Pregnant women and children under 12 years of age should consult a doctor or pharmacist before using repellents. Repellents are not recommended for children under 3 months of age.
- Use of mosquito nets.
- Use of insecticides indoors.
- Before the planned trip, a consultation on the epidemiological situation with the epidemiologist at the regional unit of the National Institute of Public Health.
- Arranging health insurance and a travel pharmacy for staying abroad before travelling and finding out where one can get medical help abroad.
- Choosing accommodation (hotel) that has adequate mosquito protection (air-conditioned cooling with tightly closed rooms, mosquito nets).
- If dengue infection is suspected, the sick person should be protected from further exposure to mosquitoes (stay under a mosquito net or indoors) to reduce the chance of mosquito bites spreading the disease to other people.