

As with other viral diseases associated with insects, the virus is transmitted to humans through the bite of arthropods, invertebrate animals such as mosquitoes; the mosquito capable of transmitting the virus belongs to the genus *Aedes*, to which various species belong.

The *Aedes Aegypti* species, the most frequent vector of the virus, lives in tropical and subtropical regions and does not survive colder temperatures. The *Aedes Albopictus* species can also transmit the virus; this mosquito can also survive even in colder areas, such as Europe.

Aedes mosquitoes do not fly more than 400 meters but can be transported from one place to another (e.g. in car trunks, with plants). If they adapt to the new climate they are able to reproduce effectively; in fact, they lay their eggs in the environment, preferably in stagnant water deposits where the eggs can become larvae and then adult mosquitoes. In conditions of dehydration, however, these eggs can survive for up to 1 year.

In addition to transmission via arthropods, other routes of transmission of the virus cannot be excluded including transmission from mother to fetus in pregnancy (discussed below) sexual transmission, recently considered by US health authorities, and contamination with infected blood, including if no cases of transmission associated with blood donation have been reported so far.

Clinical picture

The Zika virus causes in most cases a mild form of the disease; a couple of days after the bite of an infected mosquito, low-grade fever and rashes may occur but also conjunctivitis, muscle and joint pain, fatigue. These symptoms usually disappear in 2-7 days.

Laboratory diagnosis is obtained by searching for the genome or by isolating the virus, or by searching for specific antibodies in the blood of suspected patients. Potential complications As there were no major outbreaks of Zika Virus before 2007, little is currently known about the complications of the disease. However, some pathological conditions have been reported which are suspected of being linked to the viral infection.

Guillain Barré syndrome

During the first Zika outbreak in 2013 - 2014, in French Polynesia, an unusual increase was reported in Guillain-Barré syndrome, an autoimmune neurological disorder (i.e. caused by an abnormal reaction of an individual's immune system that results in a damage to one's own organs or tissues) which often occurs as a result of infections caused by the most common viruses.



A similar increase in Guillain-Barré syndrome also occurred in 2015, in the context of the first outbreak of the Zika virus in Brazil. Investigations are underway to investigate the potential role of the Zika Virus or other possible factors.

Zika Virus in pregnancy Also in 2015 in Brazil, at the same time as an outbreak of the Zika Virus, an important increase in cases of microcephaly in newborns was observed compared to the average of previous years.

Microcephaly consists of a neurological malformation that causes a reduction in the head circumference compared to the population average for age and sex; if acquired during gestation it can lead to morphological alterations, cognitive development, motor functions and language, with various levels of severity.

Given that vertical infection from mother to fetus, through the placenta (but also during childbirth or breastfeeding) had already been documented during the outbreak in Polynesia, since October 2015, Brazilian health authorities have been investigating the potential link between the virus.

Zika in pregnant women and microcephaly in their babies.

Until there is more evidence, authorities have recommended women who are pregnant or planning a pregnancy to be very careful and protect themselves from mosquito bites. Pregnant women who suspect they have Zika Virus disease should see their doctor for careful monitoring during pregnancy.

Since there is no specific vaccine against the virus, preventing mosquito bites is the best protection against Zika, as well as protecting oneself from other diseases such as Dengue, Chikungunya and Yellow fever, caused by viruses transmitted by mosquitoes.

Therefore it is advisable for those traveling to countries where the virus is in an active phase of transmission, especially pregnant women, to adopt basic protection measures against mosquito bites: it is advisable to use insect repellents, wear clothes (preferably light colored) that cover the body as much as possible, use mosquito nets for doors and windows and bed nets.



It is also important to keep empty and clean (or covered) containers that can contain even small amounts of water such as buckets, flowerpots or tires, so that the places where mosquitoes breed are removed.

In addition, pending further investigation, US health authorities have suggested that men who live in or have visited an area where the transmission of the virus is active, not to have unprotected sex with their partners if they are pregnant or if they are planning one.

Zika virus infections are not normally present in our country, where however they can be introduced and give rise to native cases thanks to the presence of a competent vector, the tiger mosquito. These are usually infections characterized by a mild flu-like picture (Zika virus fever), but in special cases the central nervous system can be attacked, with even serious damage.

CAUSAL AGENT AND INFECTIOUS CYCLE

Zika fever and its complications are caused by the Zika virus (ZIKV), a Flavivirus (closely related to those that cause dengue, yellow fever, West Nile and Japanese encephalitis). ZIKV is primarily transmitted through the bites of infected mosquitoes.

It has been isolated from mosquitoes of the *Aedes aegypti* species (also known as yellow fever mosquito) and *Aedes albopictus* (better known as tiger mosquito and also widespread in Italy). Recent

laboratory studies have demonstrated the competence of both in the amplification and transmission of the ZIKV.

According to some studies, other mosquitoes of the genus *Aedes* (in particular *Ae. Africanus*, *Ae. Polynesiensis*, *Ae. Unilineatus*, *Ae. Vittatus* and *Ae. Hensilli*) must also be considered as potential vectors of ZIKV. chik den zika cycle

The original host of the virus is not yet known, but it is reasonable to speculate that it was a non-human primate (possibly a monkey). In countries where the disease is now endemic, the reservoir is man. There are two main strains of ZIKV, one African, native, and the other Asian, derived from the first and which then spread to the Pacific and the Americas.

Furthermore, further transmission methods have been identified:

- congenital or intrauterine transmission that occurs when a woman contracts the virus during pregnancy and it passes to the fetus;
- perinatal transmission which occurs when a woman becomes infected with ZIKV within approximately two weeks of delivery and the virus passes to the newborn at or near delivery;
- sexual transmission;
- transmission through accidental contagion during laboratory activities (rare cases, however also known for other diseases);
- transmission through blood transfusions, sperm donation and transplantation of hematopoietic stem cells and infected organs.

ZIKV has been detected in the blood, urine, amniotic fluid, semen, saliva, and fluid in the brain and spinal cord (CSF) of infected people. Although ZIKV has been identified in breast milk, no ZIKV infection acquired during breastfeeding has been reported to date.

SYMPTOMS AND COURSE OF THE DISEASE

In 80% of cases, the infection is asymptomatic. Symptoms in humans, when present, are a fairly modest feverish state (below 38.5 ° C), transient joint pain with possible swelling of the joints (mainly in the hands and feet), maculo-papular skin rash, which often starts from the face, redness of the eyes or bilateral non-purulent conjunctivitis, as well as a number of general non-specific symptoms, such as myalgia, asthenia and headache.

The incubation period varies between 3 and 14 days after the bite of an infected mosquito. Febrile illness is usually short-lived (2 to 7 days) and self-limiting, without serious complications and with a low hospitalization rate. The disease may not even be recognized or mistaken for dengue.

ZIKV infection can only be fatal in rare cases, in people with pre-existing chronic diseases and severely immunosuppressed individuals.

