

Role of *Aedes Aegypti* in Dengue Infection

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ABSTRACT

Some viral infections are spread by arthropods as Dengue fever which is caused by the Dengue virus. High fever, headache, nausea, joint and muscular aches, and the typical itching and rash on the skin are a few of these symptoms. After infection, symptoms usually appear 3–14 days later. Dengue virus has different strains that do not show cross-reactivity to each other. The route of transmission of the dengue virus is by mosquitoes named *Aedes aegypti*. Different factors are involved in promoting dengue infection such as temperature, and rainfall.

Introduction:

A virus known as dengue fever is spread by mosquitoes *Aedes (A.) aegypti* in South Asia regions. Dengue symptoms include rash, headache, musculoskeletal pain, and acute fever. Dengue viruses (DENVs) comprise four antigenically related but distinct DENV serotypes (DENV-1, DENV-2, DENV-3, and DENV-4) that together form the dengue complex in the genus *Flavivirus*, family *Flaviviridae* (1). Many diseases linked to arboviruses, including dengue, dengue hemorrhagic fever, dengue shock syndrome, yellow fever, chikungunya, and the Zika virus, are mostly transmitted by *Aedes* mosquitoes (Diptera, *Culicidae*) infection. Two species that are significant for medicine are two species of *Aedes* mosquitoes that are linked to the dengue virus's spread: *A. aegypti* identified *A. albopictus*. The mature *A. aegypti* species both and *A. albopictus* have a black hue, yet they can easily be distinguished by the white scale present on their thoracic side: Egypt's *Ae* has two consecutive lines on the side encircled by curved lyre-shaped lines *A. albopictus*, on the other hand, only has one broad row of white scales in the thoracic middle (2).

Factors involved

There appears to be a strong correlation between dengue virus epidemic behavior and variations in rainfall and temperature. Numerous factors, including temperature, air moisture, and rainfall variations on a daily, seasonal, and biannual basis, can affect mosquito populations and vectorial competence (3). In tropical Southeast Asia, temperature influences the duration of the gonotrophic cycle that is linked to dengue's seasonality. Warm temperatures and high levels of moisture help to promote adult survival in situations where the bulk of breeding sites are indoors (4).

Transmission

Clusters of dengue infections may arise from multiple infections in a household after an infective mosquito enters the home or an infected household member contracts the disease. Dengue viruses are transmitted from person to person by the bite of an infected *A. aegypti*. Humans are the main host and source of viruses for female mosquitoes, which feed on infected human blood. Because infection with the dengue virus results in high titers viremia of about 7 days. Transmission is possible through exposure to infected blood, organs, and tissues. Dengue virus is not transmitted by saliva and respiratory droplets (6).

Virulence

It is unknown with precision what level of human viremia is needed to transmit the virus to mosquitoes. In cases of spontaneous infections, human virus titers can reach up to 10⁸ Mosquito infectious Doses₅₀ (MID₅₀) per milliliter (5).

Mosquito passage and viral genetics

Each strain of the dengue virus may be analyzed based on the genetic variation. An increasing number of comprehensive analyses of the genetic changes observed in dengue virus populations within a single dengue type, along with information about the relative survival of the distinct virus populations, have been caused by the prevalence of fully or partially sequenced dengue viruses. Almost all dengue viruses have been acquired through necessity from sick individuals. It has been a continuous attempt to identify similarities between viruses recovered between severe and mild human infections. It has recently gained popularity to investigate the dengue virus transmission in foci or family members. The idea that distinct viral strains are linked to disease in contrast to infections that don't seem to be present should be put to the test even more rigorously by the discovery of viruses from silently infected humans.

Conclusion

It is necessary to control the dengue virus by preventing freshwater accumulation in the open environment. Control of the population of mosquitoes may lead to control of the dengue infection.

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