Dengue

Dengue is a viral infection transmitted by mosquitoes and stands as the foremost cause of arthropod-borne viral diseases globally, representing a considerable public health issue. This illness is often referred to by various names, including breakbone fever or 7-day fever, and is marked by severe muscle spasms, joint discomfort, and elevated body temperature, which highlight both the intensity and duration of its symptoms. While a majority of dengue fever cases are asymptomatic, there exists a risk of severe illness and death. The virus is primarily spread by female Aedes mosquitoes, notably Aedes aegypti and Aedes albopictus, which are prevalent in tropical and subtropical regions.[1,2]

The prevalence of dengue fever has surged significantly in recent decades, with the infection becoming endemic in certain areas, likely as a result of increased international travel. This disease presents a major public health challenge, with more than 100 million cases reported each year and an estimated 20,000 to 25,000 fatalities, often associated with epidemics in various global regions. Following infection with a variant known as dengue hemorrhagic fever (DHF), some individuals who have previously contracted one strain of the dengue virus (DENV) may experience severe capillary leakage and bleeding.[3]

Belonging to the Flaviviridae family, the dengue virus is a 50-nm virion comprising 3 structural and 7 nonstructural proteins, a lipid envelope, and a 10.7-kb-capped positive-sense single strand of RNA. Infections are asymptomatic in up to 75% of affected individuals. The disease spectrum ranges from self-limiting dengue fever to severe hemorrhage and shock. A fraction of infections, between 0.5% and 5%, develop into severe dengue. Without proper treatment, fatality rates may exceed 20%, particularly among children. The typical incubation period for the disease is 4 to 7 days, with symptoms lasting from 3 to 10 days. Symptoms appearing more than 2 weeks after exposure are unlikely to be attributed to dengue fever.

The consequences of a mosquito bite injecting the dengue virus into the skin remain unclear. Skin macrophages and dendritic cells are believed to be the initial targets. These infected cells are thought to migrate to the lymph nodes and disseminate through the lymphatic system to other organs. Viremia, the presence of the virus in the bloodstream, may occur for 24 to 48 hours before the onset of symptoms.[4]

The presentation of dengue fever, whether asymptomatic, typical, or severe, is influenced by a complex interplay of host and viral factors. Severe dengue fever, characterized by heightened microvascular permeability and shock syndrome, is often associated with infection by a second dengue virus serotype and the patient's immune response. However, severe cases of dengue fever can also arise from infection by a single serotype. Interestingly, microvascular permeability tends to escalate as viral titers decrease.[5]

References

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