



Chikungunya: Resurgent Arbovirus and its Impact in Brazil

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Introduction

The Chikungunya virus (CHIKV) is an alphavirus transmitted by the bite of blood-sucking mosquitoes and causes a significant public health problem in tropical and subtropical regions [1]. The disease carried out by the virus is generally characterized by acute fever in the first days, the presence of skin rashes and polyarthralgia accompanied by headaches, joint swelling and inflammatory conditions such as conjunctivitis. Hematophagous arthropods vectors such as: *Aedes aegypti* and *Aedes albopictus* are the most common transmitters of Chikungunya fever to humans [2].

Since its discovery in 1952, four CHIKV genotypes have been identified and characterized. The East-Central-South African (ECSA) and West Africa genotypes began their endemic process in Sub-Saharan Africa. The Asian genotype is circulating from urban transmission in Southeast Asia. The viral lineage of the Indian Ocean (IOL) caused explosive epidemics in the period 2005 and 2011 in the Indian Ocean and Asia [3]. This strain harbors mutations that increase its infectivity and transmission capacity in *Ae. Albopictus*, making transmission to humans also reach the temperate regions. As of October 31, 2014, there were reports of more than 1,200,000 suspected cases of CHIKV in the Americas, and cases of indigenous infections were confirmed in 50 territories in the region [4].

In 2014, we were able to observe the emergence of cases of CHIKV infections in the Brazilian territory. On September 13, 2014, the first indigenous case was confirmed in the State of Amapá. Soon after the first confirmation, other cases also arose in the State of Bahia, until the Ministry of Health released on October 18, information on the confirmation of 682 indigenous cases in the country. Imported cases of the disease were a major related problem the increase in infected patients in all Brazilian states.

The whole reality of the Brazilian territory was a factor in favoring the introduction and expansion of the virus. The vectors can be located in more than 4,000 municipalities (*Aedes aegypti*) and in the case of *Ae. Albopictus*, was observed in 3,285 municipalities. A wide flow of people, a high vector dispersion and the population's susceptibility to infection are also important variables for the construction of the disease's infectivity [5].

A scenario marked by the coexistence of arboviruses has been outlined in Brazil since the introduction of the disease. The impacts were observed in several sectors, from health services to the costs of services targeting vectorized diseases, in order to minimize their effects on society [6].

Figure 1: Number of confirmed cases of CHIKV in the epidemiological weeks for 2018 and 2019. Source: Sinan Online (updated database 2018/2019 - Adapted from Health Surveillance Secretariat - Ministry of Health of Brazil). There was a significant increase in the number of cases and in the notifications of patients infected with CHIKV in 2018 to 2019 (Figure 1).

These figures reflect the confirmed cases of the disease, which may still be due to the notifications. The growing number of cases can be associated with the entire basic sanitation infrastructure, as well as poor health services in low-income populations [7].

There are still no antiviral treatments and vaccines against CHIKV. Many research groups are working on tests with drugs that are candidates for an effective antiviral. The treatment currently offered to the population consists of supporting the symptoms caused by the disease [8]. Currently, many substances are being tested against CHIKV. Synthetic, semi-synthetic and natural

products are tested in in vitro and in vivo models [9-13].

During the outbreak from 2014 to 2016, there was an immense difficulty in characterizing the disease in clinical services, precisely because of the problem of the availability of specific tests for

diagnosis within the public health system. After the characterization of the tests as RT-PCR and other immunological tests, the accuracy of notifications of confirmed cases of CHIKV was further increased [4,14].

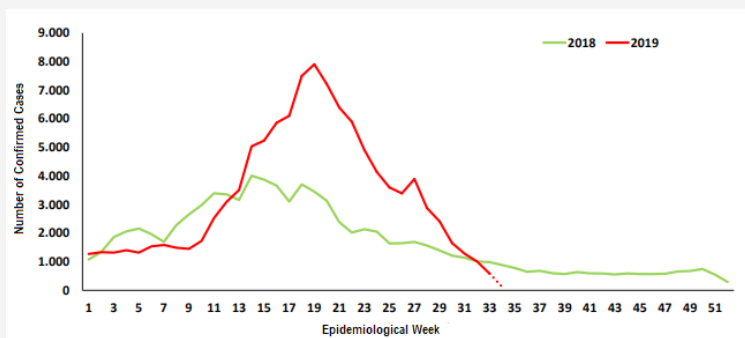


Figure 1: Number of confirmed cases of CHIKV in the epidemiological weeks for 2018 and 2019. Source: Sinan Online (updated database 2018/2019 - Adapted from Health Surveillance Secretariat - Ministry of Health of Brazil).

Conclusion

Chikungunya fever is currently a public health problem that affects many people in Brazil. The development of new technologies involving diagnostic tests favored the characterization of the disease state throughout the national territory. There is a growing need for the discovery of effective therapeutic alternatives against CHIKV. The impact of this disease in Brazil consists of a Health, Social and Economic issue.

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Conflicts of Interest

No conflicts of interest.

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