

The triple epidemic of Arboviroses in Brazil. What does this mean? Are we ready?

We all knew that dengue was a public health problem in Brazil! Some of us even knew that dengue was a serious public health problem! However, we all need to know that now it will be more complicated!

Dengue has been circulating in our country since the 1980s. It has been the focus of dozens of national research funding notices during this period. However, approximately two years ago two problems “emerged”: the possibility of the circulation of both the Chikungunya and Zika viruses. This possibility has become a reality and in recent months several municipalities have already reported outbreaks of these three diseases.

The **dengue** virus belongs to the *Flavivirus* genus, of the *Flaviviridae* family. Infection with the dengue virus causes an acute, dynamic and systemic illness characterized by high fever (40°C), with the presence of two or more symptoms: intense muscle and joint pain, headache, muscle weakness, retro-orbital pain, nausea and vomiting. In 50% of cases a rash is present, affecting the face, trunk and limbs, including the palms of the hands and soles of the feet. In severe cases various organs may be compromised.¹

The **zika** virus (ZIKV) is an arbovirus of the *Flavivirus* genus, of the *Flaviviridae* family. The ZIKV causes a febrile illness, with the presence of a skin rash, conjunctivitis, and fever above 38.5°C, arthralgia, headache and arthritis. These symptoms are usually self-limiting and last between 2 to 7 days. However, approximately 80% of cases are asymptomatic.²

The **chikungunya** virus (CHK) is an *alphavirus* belonging to the *Togaviridae* family. It causes a feverish illness accompanied by headache, joint pain and reddish spots on the body. Chikungunya is classified into three stages depending on the progress of symptoms (acute, subacute and chronic).³

All three are transmitted by the same vector, the *Aedes aegypti* mosquito.

From January to April 2016 1,054,127 probable cases of dengue were recorded, in addition to 64,349 cases of chikungunya and 120,161 cases of Acute Disease by Zika virus. The notification of suspected cases of chikungunya has been observed in 1,358 municipalities and the notification of Zika in 1,605 municipalities in all regions.^{4,5}

What is the problem? How to diagnose these diseases in the early days if the symptoms can be very similar? It is even worse if the diagnostic kits available on the market today are not able to differentiate between these viruses and often show false positives.

There are states in Brazil that are reporting dengue epidemics, but which are clearly due to chikungunya or zika, but the IgM results available in the health system, are not specific enough to detect this difference. How can we justify states that have a dengue epidemic for two or even three years in a row, without at least the circulation of a new serotype? Of course these are not cases of dengue, but only time will confirm these hypotheses that are already widely discussed among researchers and the specialized health services.

What is the big challenge now? Research, research, research...

Do we need to understand how to deal with this triple epidemic? What can be done to structure our health system for the initial care of these suspected patients? What will we do with the cases of microcephaly? What will we do with the chronic chikungunya patients?

Given this framework of uncertainty, there have been few funding notices that can help to address these problems. For the most part, they have been offered by international organizations. We need to encourage national agencies and especially the state FAPs to prioritize resources to these areas. Do we need to understand what scenario we have with this triple circulation?

From the public health perspective, we need to think of and propose harm reduction policies for cases of Zika virus infection during pregnancy and pain management for chronic chikungunya patients. Furthermore, and simultaneously, we must implement the changes necessary for the proper management of severe cases of dengue to reduce “avoidable” deaths.⁶ We have to enforce the established protocols for the management of patients with dengue. It is therefore legitimate to treat this set of problems as a public health emergency.

Public policies need to increase investments in technology and human resources for health care to the population in endemic areas, particularly planning the best way to use resources in primary care. Although many infections behave asymptomatic, the majority

of symptomatic patients can not have your clinical absolutely clear because of the difficulty in implementing appropriate laboratory tests. Many do not receive the results of the tests that were picked because they are not evaluated by the competent institutions.

What is the challenge ever? investment, investment, investment ...

Unfortunately, this triple epidemic scenario comes at a particularly delicate moment of great political and economic instability, which further enhances our vulnerabilities and strongly limits the investment and financing of research, which should certainly be one of the essential aspects of an appropriate government response to this issue.

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