

## Chikungunya: General aspects of Arbovirus

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### SUMMARY

This study, it is a systematic review of scientific articles published in the last 5 years on arbovirus Chikungunya. The investigation of these materials was held during the month of April in the databases of CAPES and Scielo, with interest of bringing the General aspects of the arbovirus Chikungunya, as well as investigate whether recent articles bring new aspects and discoveries about this arbovirus. It was observed that the interest in the subject had a significant increase especially in the last two years, what features to be closely related to the increase of cases in the Brazilian context, and even ignorance on the part of professionals and scholars on the subject. It is expected that this article can get subsidies of knowledge not just for professionals and researched, but for society as a whole as public information.

**Key Words:** Arbovirus. Chikungunya. Chikungunya Fever.

### INTRODUCTION

The risk of large-scale epidemics as pandemics have become increasingly common in humanity due to historical accounts. In the first decades of the 21st century, some events have been identified that certainly prompted the attention of researchers, about the risks and impacts of high-potential viral epidemics such as: avian gripe, swine flu, Influenza A (H1N1), Ebola and more recently arbovirus like Zika virus and Chikungunya (VIASUS; DE LA HOZ, 2015).

According to Lee, Nozawa and Linhares (2014), arbovirus are transmitted by animals arthropods like insects, the best known today is the *Aedes Aegypti*, however, it is estimated that there are approximately 545 of arbovirus species divided into 5 families, and more than 150 are associated with diseases transmitted to humans. From diseases of arbovirus are transmitted to humans through bites, hematophagous insects.

There is to observe that the risk of epidemics from becoming pandemics occurs mainly through intense intercontinental flow where the agents transmissive migrate with a much more intense, in addition, the infected individuals. However, other aggravating, as climate change caused by both anthropogenic factors such as natural factors should also be considered (VALENCIA, 2015). These factors increase the incidence of pathogens related to tropical climates, such as the arbovirus (MANIGAT, WALLET, ANDRÉ, 2011).

According to Lee, Nozawa and Linhares (2014), until the moment we can say that the only continent where the arbovirus are not endemic threats to humans, is the Antarctic continent. This happens because for the reproduction of the virus are necessary climatic conditions suitable for their vectors, hosts

amplifiers and shells. The arbovirus have a great ease of dispersion being able to keep your cycle vertically, where adults transmit the virus to their proles, or even to other mosquitoes of its kind during mating or infecting through hematophagy. This group of viruses is composed mainly of RNA genomes (FERREIRA, 2015).

RNA viruses have a profound ability to cause disease to humans, mainly because of the ease that these viruses have to adapt quickly to the environment in which they find themselves, as well as its ability to explore new contacts, what makes it possible to have new hosts, amplifying its vectors, making them great pandemic enhancers (TSETSARKIN et. Al., 2011).

According to Tsetsarkin et. Al. (2011) should consider also the high capacity of arbovirus mutation because they have a weak base RNA constantly RNA of these viruses is modified, these mutations can happen by means of natural selection or as a result of contact with other species, the two ways to evolve the virus, making it more resistant and difficult to be tackled.

Focusing on the aspects of the Arbovirus Chikungunya, it is important to note that this belongs to the family Togaviridae is of the genus *Alfavirus*, being known to mankind for centuries. Since the 18 century there are records of outbreaks of this virus in humans, the Chikungunya returned to worry about humanity when several cases were registered in various countries of the world, as countries from Africa, Southeast Asia and Indian Ocean islands, Italy and France, in the early years after the year 2000 (COFFEY, 2011).

The word Chikungunya comes from the Makonde of Tanzania would follow, and literally means "that which bends up", this name was adopted because the pain of arthritis caused by the virus that infected individuals bow upwards (WANG, et. Al., 2011).

The Chikungunya is generally transmitted by the *Aedes aegypti mosquito*, the same transmitter of diseases such as Dengue, Zika virus, and the Oropouche fever. This mosquito adapts better to warm climates, tropical and subtropical (COFFEY, 2011). The Chikungunya virus infected person suffers from a crippling disease highly infectious, which causes fever, fatigue, rashes and polyarthralgia disabling these symptoms last for about 10 to 12 days. The virus is also associated with meningoencephalitis, myelopathy, peripheral neuropathy, myopathy and polyneuropathy. And there are still cases that the virus has been associated with cardiovascular diseases, eyepieces and even kidney complications. One of the aggravating this virus is in fact the infected person can continue with sequels after this period (RHAIM; Mathew, 2011).

According to Honorius et. Al. (2015), in Brazil the first case of Chikungunya was registered in September 2014, at the city of Oiapoque in the State of Amapá in Brazil. Throughout the year were registered nationwide 2,772 cases in six different States, Amapá, Bahia, Distrito Federal, Mato Grosso do Sul, Roraima and Goiás.

### **Chikungunya: Transmission**

According to Albuquerque et. Al. (2012), one of the factors that hinder the diagnosis of Chikungunya is that diseases from the arbovirus, like Dengue, Zika, can occur simultaneously in the same individual. In these cases what should observe particular symptoms of each virus, as the bleeding on dengue fever and deep pain in the joints in the case of Chilungunya.

This time, according to Hall et. Al. (2012), it is essential that there is an estimate or accurate detection of virus infection for a population of vectors, and even diagnosis of infections in humans and animals from that holding the reception and follow-up as well as effective pharmacological treatment are essential factors for the survival of the infected and also to try to prevent the spread of infections.

Various forms of transmission of Chikungunya have been found in the literature investigated, among them was appointed the transmission through blood transfusions. Because of this, the countries that have a high number of people infected, should exercise greater care in blood transfusion procedures, so that the chances of the blood being infected by the virus (reduce PIMENTEL; SKEWES-RAMM and MOYA, 2014). The study of Rolón et. Al. (2015) demonstrated the transmission of Chikungunya can occur through pregnancy, however, has not yet identified the transmission through breastfeeding.

According to Forbes and Forbes (2014), have not yet been identified results of studies of vaccines that could be considered with high efficiency against the arbovirus, the fight against mosquitoes as vectors *Aedes Aegypti* and *Aedes Albopictus*, must still be regarded as the most effective prevention against those capable of producing a pandemic.

### **The disease**

The studies already carried out addressing the Chikungunya virus, have shown that the disease has two phases, acute and chronic. The acute phase is the initial phase of the disease, usually lasts from 3 to 10 days, the symptoms of this period are: high fevers, headaches, fatigue, muscle aches, conjunctivitis, photophobia, facial edema, nausea, vomiting, and may present skin lesions and rashes on the feet, hands and mucous body regions (MOYA, PIMENTEL and PUELLO, 2014).

Already the chronic phase is of longer duration, it can have up to 12 weeks duration, she does not present symptoms such as high fever, conjunctivitis, headaches, however, the muscle pain in the joints, bringing arthritis, can also submit anorexia, depression and skin flaking. On account of these severe symptoms this phase makes the infected simple activities. The clinical picture of people infected by these arbovirus is the Chikungunya, Zika virus or Dengue, it hurts the quality of life of the individual, as well as the severity of these ailments, he can still stay with sequels throughout the rest of his life.

Honorius et. Al. (2015) allude to the possibility even if you reach a remote death and permanent sequelae. The most common permanent sequelae are associated with arthritis from the virus significantly worsen the quality of life of the subject. Due to the strong arthritis caused by Chikungunya virus, the infected individual is unable to perform several moves, it makes it impossible to work and do the housework and personal. The deep arthritis occurring in symptomatic period is one of the features that distinguish the Chikungunya, these arthritis may remain as permanent sequelae in the infected person (HORCADA, DIÁZ-CALDERÓN and GARRIDO, 2015).

### **Treatment**

Treatments for those infected by Chikungunya virus or Zika virus are based mainly on drug administration, i.e. the use of medications such as painkillers and anti-inflammatory drugs. According to Montero (2014), as I still don't have a vaccine for this virus, the main way to avoid infection is by trying not to attend places where there are recorded cases, using insect repellents on the body so that the

transmitting mosquitoes do not approach, and recommends be careful with dare of perfumes because they can attract insects and seek to be in places with air conditioning because the unit inhibits the movement of insects in this environment.

## Final Considerations

In addition to all these health-related losses of the infected person, these diseases also bring economic losses, due to the various diseases people become unable to work, which leads to economic losses to entrepreneurs who have their workmanship shorn. And even with the increase of infections in all Governments at all levels have a greater need to invest in public health, which carries on more public spending (HONORIUS et. Al. 2015).

However, one can consider that there are still a few academic and scientific research that address this arbovirus, mainly in Brazil. The studies analyzed it can be observed that little has been researching the way the virus develops in the human body, being one of the main reasons responsible for the lack of creation of effective vaccines (Jaramillo, 2014).

Transmitting mosquitoes as the *Aedes aegypti* are spread throughout all Brazilian States, and is dispersed by all the urban regions of the country. Already the *Aedes albopictus* is found in the municipalities of almost all Brazilian States, except the States of Sergipe, Acre, Amapá and Roraima (AZEVEDO, OLIVEIRA and VASCONCELOS, 2015).

Agree, with the claims of Van Den Hurk et. Al. (2012) and the need for measures to be taken by implementing control strategies to arbovirus that cause exotic and endemic diseases. A comprehensive surveillance strategy is essential in order to decrease the number of cases of infections which increase more and more not only in Brazil, but also in other countries of the world.

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