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STUDIES ON SEROEPIDEMIOLOGY COMPARATIVE ANALYSIS OF RICA AND MAC ELISA AND MOLECULAR DIAGNOSIS OF CHIKUNGUNYA VIRUS

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ABSTRACT

Chikungunya (CHIK) is an arthropod-borne viral disease that is widespread in Africa, Southeast Asia, the Western Pacific, and India. It is one of the six major vector-borne diseases among the endemic diseases in India and the recent outbreak has again led to severe deaths. The small-scale outbreak in Africa and Asia has reduced the incidence, as well as globalization and the expansion of the mosquito vector. Currently about 40 indigenous people are under the control of CIKV disease and more than 5-10 million people are victims.

KEYWORDS : *Chikungunya (CHIK) , arthropod-borne viral , Western Pacific.*

INTRODUCTION

A mosquito infected with CHIKV, most people suffer from a symptomatic disease after a period of three to seven days. However, not all people infected with the virus develop symptoms. Sero Services show that between 1% and 2% of individuals with antibodies to CIKV are infected with disease, whether clinically exposed or antiviral, and that the presence of a virus-infecting vector may contribute to the spread of the disease and active in the same place. CHIKV can cause acute, sub acute, and chronic illness. Acute severity of acute illness and acute joint pain are most often seen.

- The fever usually lasts from several days to a week. The fever can be persistent or moderate; a drop in temperature is not associated with an increase in symptoms. Sometimes fever can be associated with associated bradycardia.
- Symptoms in the joints are usually symmetrical and are usually found in the hands and feet, but they can affect the joints closer together. Swelling can also be seen and most often they are associated with tenosynovitis. Patients are often severely incapacitated due to pain, tenderness, swelling and stiffness. Many patients cannot perform normal tasks or go to work and many of these symptoms will be confined to bed.
- About half of all patients develop acne two to five days before the onset of fever. It is usually conical in shape, involving the trunk and limbs, but can also include the palms, soles, and face. Acne can also present as diffuse erythema which bleaches with pressure. In infants, vesiculobulin lesions are often the most common manifestation of skin.

Concerns about CHIKV were heightened when an infected passenger from India learned that he had contracted the virus in northern Italy after 200 years. In September 2010, an autoimmune disease, chikungunya, was reported in south eastern France. That same year, CIKV caused the disease in India,

Indonesia, Myanmar, Thailand, and the Maldives, and re-emerged on the island of Reunion. In 2010, imports were recorded from Indonesia, Reunion Island, India and Asia to Taiwan, France, USA and Brazil respectively. In 2013, CHIKV arrived on the American continent, initially spreading to the Caribbean, before reaching Brazil in 2011. Two years later, in 2015, the CDC declared CHIKV a notable disease. The most recent CHIKV outbreak occurred in February 2018 in Mombasa, Kenya.

CHIKV infection manifestation:

1. **Acute:** About 50-97% of people infected with CIKV have a clinical course of fever and arthritis. CIKV infection is associated with sudden onset of inflammatory disease, arthralgia, back pain headache (of 2% of patients) and fatigue. The most common symptom of CIKF is polyarthritis, usually of a bilateral multifaceted nature, mainly affecting the peripheral joints and some large joints (knees and elbows). Skin manifestations are reported in 50% of skin lesions. Injuries are characterized by macular or transitory maculopapular eruptions, which can cause swelling or itching, most often on the hands, palms, feet, torso, and face. Diarrhea, vomiting, nausea and abdominal pain gastrointestinal symptoms are found in 15-7% of cases. Other possible symptoms include erythema, asthenia, conjunctiva fusion, conjunctivitis, and cervical lymphadenopathy. Various studies have shown that CHIKV infection can reach high viral loads in 105 to 109 copies of viral RNA / mL, which are related to the presence and severity of clinical signs and symptoms.
2. **Chronic:** Polyarthritis and / or polyarthritis are symptoms of acute chikungunya, most often affecting small joints such as the fangs and wrists. The condition is usually severe and limits the range of motion of the affected patient. Polythralgia is described as surviving in different periods, ranging from weeks to several months, and in some cases, up to five years, the population is assessed. In some alpha viruses, such as SFV and SINV, the persistence of polyarthritis seems to be related to the persistence of viral antibodies and immune response (inflammation) in the joints. As for viral antigens, there is still no consensus on whether they have replication capabilities or only as a result of delayed approval of non-replicated viral antigens. Precisely on CHIKV, a 2010 study found the presence of macrophages with CHIKV genetic material and viral proteins in the synovial tissue of a long-infected patient for 18 months. Experimental studies have shown persistence of CIHVV in macrophages in lymphoid organs, liver, joints, muscles, and NHP. In addition, the presence of infiltrating cells in the synovial fluid, primarily macrophages, monocytes and lymphocytes, and specific proinflammatory mediators such as IL-6, IL-8, and MCP-1, also contribute to the severity of inflammation. In addition to chikungunya disease, severe cases of chikungunya may be related to age and various underlying medical conditions, such as high blood pressure, respiratory conditions, and diabetes mellitus due to insulin deficiency.
3. **Atypical:** CIKV infection can also lead to atypical clinical manifestations. For example, Gillian-Barry Syndrome (GBS) is associated with CIHVV infection. GBS is a global phenomenon of acute inflammatory demyelinating polyneuropathy in which dengue, West Nile-influenza, cytomegalovirus, human immunodeficiency-Epstein-Barr, and Zika viruses are found in almost two-thirds of the cases followed by bacterial or viral infections. During recent outbreaks of CHIKV, total or partial itching on the head or body, mainly in female patients, and ophthalmic changes such as conjunctivitis and retinitis, were described in the acute phase of the infection. Congenital infections in newborns can have a variety of clinical signs, including fever, loss of appetite, respiratory, skin manifestations, distal and cerebral edema, encephalitis, and bleeding. Cardiac and gastrointestinal disorders and skin lesions appear two days after the onset of fever in CHIKV-infected infants and children. In the case of a bull wound associated with CIKV infection in four-month-old babies, it was also found that 20% of the body was affected the day after the fever. Earlier, deaths due to CHIKV infection were considered a rare occurrence. This perception has changed since the latest epidemic, with a high incidence of death due to neurological affection, mainly in new borns, immune compromised and the elderly.

It is challenging to distinguish clinical signs and symptoms of CICV infection from other pathologies, especially when ZKV and DENV co-exist in the same geographic region. Individuals infected with this arbovirus may present a wide range of clinical manifestations such as acne, myalgia, exanthema, arthralgia, joint pain, headache, lymph node hypertrophy, neurological impairment, and fever. In addition, it is difficult to determine the frequency and severity of symptoms and to properly assess the pain of suffering patients. In this context, differences in the clinical presentation of cases may indicate viral etiology; For example, major and chronic polyarthritis, often accompanied by acne, is usually more indicative of chikungunya, whereas hemorrhagic spikes and myalgia appear more commonly in DENV infection. Although patients with CHIKV / DENV, CHIKV / ZIKV, and CHIKV / DENV / ZIKV are infected, often do not exacerbate clinical signs, co-infection presents as an additional barrier at differential diagnosis.

Laboratory Test:

Laboratory tests for the specific diagnosis of CIKV infection are based on virus isolation, viral RNA identification, and serology. Although there is usually no job in routine diagnosis, viral segregation can be achieved by inoculation of sera and mosquito- or mammalian cell lines up to seven days after the onset of the disease, with cytopathic effects appearing within one to three days after inoculation. Results can be confirmed by immunofluorescence or RT-PCR assays. Recently, anti-CHKV E1 monoclonal antibodies were used to detect different CIKV genotypes in samples of severely infected patients in an immune chromatographic assay. This highly specific and sensitive test can also be an alternative method for diagnosing CHIKV infection. Molecular methods of CIKV diagnosis such as RT-PCR, RT-LAMP, QRT-PCR have gained increasing importance. They are more sensitive and faster than viral isolation and allow the detection of RNA from all CHIKV lineages with high specificity. Usually, serum samples collected up to seven days after symptom-onset are appropriate for detecting CHIKV through a molecular diagnostic platform. In addition, novel multiplex essays are able to differentiate CHIV from other infectious agents with the same clinical spectrum. Among them, the RT LAMP assay has been shown to be able to differentiate between ZIKV, CHIKV and DENV transitions. There was recently an RT-QPCR capable of successfully differentiating between ZIKVCHIKV-DENV and CHIKV-DENV-Leptospira infections.

CONCLUSION:

Currently, areas that were only localized to DENV are, for example, autoimmune cases of Chikungunya and Zika diseases. These arboviruses are similar to the clinical spectrum and require an efficient laboratory diagnosis, especially for the diagnosis of severe epidemics. In addition, CIKV infection represents a serious public health problem. Excessive lesions of chikungunya often occur in the absence of the victim, with psychological and economic consequences. In this context, the development of specific anti-CHIKV drugs is definitely an important demand. On the other hand, integrated vector management should be combined with large-scale vaccination in the ideal control strategy for CHIKV. Although different vector biocontrol strategies are promising, primarily in integrated use, it is important to consider their sustainable use by evaluating their actual impact on the environment. The absence of CHIKV serotypes is considered a facilitator in CHIKV vaccine development, as a stretch-forming formulation develops immunity against all CHIKV. Despite recent advances in vaccine policy, a major challenge to the development of the CHIKV vaccine is to strike a balance between immunogenicity and safety, especially in reducing adverse effects, such as secondary arthritis after vaccination with the immunodeficiency virus. Finally, recognizing the potential of vector and arbovirus control measures, we feel that planning to prevent CIHVV infection should be done from a global and multilateral perspective. This interdisciplinary policy, currently formulated in a health concept, should bring together all aspects of health care for humans, animals and the environment.

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