



Zika Virus Infection, Summer Olympic and Paralympic Games in Rio 2016, and Sports Performance

by

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Dear Editor,

Viral diseases in competitive athletes have attracted considerable interest. The environments in which these athletes compete, their training and travel involved provide numerous opportunities for diseases transmission and infection (Turbeville et al., 2006). Ximenes et al. (2016) proposed a mathematical model to calculate the risk of dengue acquisition by foreign tourists at the Olympic Games in Rio 2016 and concluded that if dengue returned in 2016 with the same pattern observed in August 2007, the incidence of symptomatic and asymptomatic cases among tourists would be 5.75 and 51.5 per 100,000 individuals, respectively.

Zika disease, transmitted by the same mosquito (*Aedes aegypti*) as dengue, has become a public health issue, drawing the attention of the scientific and sports community as well as the World Health Organization due to its rapid propagation. Brazil has been of a particular focus given the upcoming 2016 Summer Olympic and Paralympic Games in Rio (Petersen, 2016; WHO, 2016). Pau Gasol, an NBA basketball player previously enrolled in a medical school before pursuing a sports career, is considering not attending the Olympic Games in Rio 2016 due to Zika disease. He pointed out that athletes needed more information before taking a decision because their health is at risk (The Guardian, 2016). Serena Williams, the top-ranked female tennis player in the world, has also voiced concerns about the Zika virus and plans to take multiple precautions while taking part in the Games (The Washington Post, 2016).

Zika disease is caused by a ribonucleic acid (RNA) virus, specifically, *Aedes* mosquito-borne flavivirus. It is an undifferentiated systemic febrile illness and its acute clinical presentation can include headache, fatigue, myalgia (muscle pain), arthralgia (joint pain), asthenia (weakness), edema in the lower limbs, anorexia (reduced appetite) and gastrointestinal disturbances (vomiting, diarrhea and abdominal pain) (Waggoner and Pinsky, 2016).

Diagnostic confirmation of Zika fever includes viral culture, antibody, antigen and RNA detection (Waggoner and Pinsky, 2016). However, clinical diagnosis may be inconclusive and confounded with other diseases and conditions such as Dengue and Chikungunya (Pinto Junior et al., 2015).

There are no vaccines or specific antiviral drugs for treating the disease. The use of analgesics and antipyretics should be prescribed with care to avoid adverse effects such as hepatopathy, nephropathy and allergies. The use of salicylates (aspirin) should be discouraged to prevent internal bleeding in wrongly diagnosed individuals (Pinto Junior et al., 2015).

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Although no relevant data is available in the literature, we may hypothesize that reported symptoms of Zika fever potentially impair sport performance as a result of muscle impairment. In dengue infection, which has similar symptoms to Zika disease, Kalita et al. (2012) evaluated the muscle involvement and damage in 13 patients. Muscle biopsy revealed interstitial hemorrhage without inflammation or vasculitis (inflammation of blood vessels) with a median creatine kinase level of 480 U/L (300-2,477) U/L. Also, Misra et al. (2012) evaluated 39 patients with dengue of whom 31 showed evidence of muscle impairment (clinical and subclinical symptoms), eight had severe weakness and five hyporeflexia (reduced or absence of reflexes). Recently, Brasil et al. (2016) evaluated 364 suspected cases of Zika in the state of Rio de Janeiro based on clinical diagnosis. Of these cases, 71.9% (262) were tested (by Zika virus RNA detection) and 45.4% (119) had a confirmed diagnosis of the disease. It is important to point out that over 50% of the patients reported muscle impairment.

Given that mega sporting and mass events put people at risk of acquiring infectious diseases (Petersen, 2016), promoting protection strategies and dissemination of accurate information may be necessary to prevent disease infection among athletes. Strategies such as air conditioning in the Olympic Village bedrooms, use of insect repellents, protective clothing and insecticide-treated mosquito nets should be used (WHO, 2016; Ross, 2016) to ensure that athletes optimize their performance and experience at the Rio 2016 Olympic and Paralympic Games.

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