

1 ZOOBOTIC AND VECTOR-BORNE DISEASES

a Zika virus — a South African perspective

A 46-year-old industrial mechanic, resident in Cali, Colombia, arrived in Johannesburg on Wednesday 10 February. He became ill on Monday 15 February with anorexia, fever, and a fine, punctuate-like rash on his hands, thorax and neck. He had no joint or muscle pain, or conjunctivitis. He visited a private general practitioner who advised Zika virus testing. His illness was short-lived, and he felt better within 3 days. His blood specimen was positive by PCR for Zika virus at a private laboratory in Johannesburg. A second PCR test on the same specimen was conducted by the NICD, and confirmed the positive result. This is the first case of Zika virus infection imported into South Africa.

Zika virus (ZIKV) was recognized as a human pathogen for the first time in 1964 following an occupationally-acquired infection. The virus was isolated for the first time from a sentinel monkey in Uganda in 1947 and from *Aedes africanus* mosquitoes the following year. The virus remained confined to the equatorial belt of Africa and Asia, until 2007 when it caused an outbreak on Yap Island in the Pacific Ocean, followed by a rapid expansion of the virus' geographical range throughout other islands in the Pacific Ocean. In 2014 ZIKV reached South and Central America and spread explosively. As of February 2016, 23 countries in the Americas and Caribbean have reported active transmission of ZIKV. In Brazil alone estimation of ZIKV infections ranges from 500 000 to 1.5 million in 2015. Due the rise in cases of microcephaly and neurological disorders likely associated with ZIKV infections, the WHO recognized this situation as a public health emergency of international concern (PHEIC) on 1 February 2016. This declaration calls for a more co-ordinated effort to improve surveillance, mosquito control programs and fast-track the development of diagnostic assays, vaccines and antiviral therapeutics for ZIKV to investigate the causality of the observed disorders. As the number of cases increases, stronger scientific data will become available to better understand the pathogenesis of neonatal abnormalities. Recently the virus was detected in the amniotic fluid of two fetuses with microcephaly, and more convincingly in a separate study, the virus was detected in the brain of a fetus associated with severe brain injury and vertical transmission. A few cases of possible sexual transmission have also been observed, in addition to the isolation of ZIKV from infected patient semen. However, sexual transmission of ZIKV

remains a rare mode of the virus spread among humans.

Clinical diagnosis of ZIKV disease is complicated due to the non-specific clinical presentation and similarity with other arboviral infections especially dengue fever and chikungunya. About 80% of human infections are asymptomatic. Symptoms of ZIKV infection include fever (<38.5 °C), maculopapular rash, arthralgia (specifically involving the small joints of the hands and feet) and conjunctivitis. Laboratory diagnosis of acute ZIKV infection can be achieved through virus isolation in mice or tissue culture, and molecular testing by ZIKV specific RT-PCR. Due to the transient viremia caused by ZIKV infection, these assays are most useful up to day 5 post-disease onset. Serological testing is more complex due to the high level of cross-reactivity between flaviviruses. Diagnosis by serological testing is most accurate when testing paired serum samples collected at least 14 days apart. However, interpretation of serological result is complex and need to be addressed on a case-to-case basis. Infection with ZIKV is expected to induce lifelong immunity. The travel and clinical history of the patient must always be taken into account in aiding laboratory diagnosis. Cases submitted for laboratory investigation should have an epidemiological link to current ZIKV outbreaks. This implies a recent travel history to an affected country and/or sexual contact with a male who has travelled to one of the affected countries and has a history compatible with ZIKV disease. The required specimen type for ZIKV laboratory diagnosis is clotted blood or serum. There is no vaccine or treatment available for ZIKV.

The risk of ZIKV infection to the general South African population is low. The virus has not been reported in South Africa over decades. The highest health risk is to the unborn of pregnant women travelling to ZIKV affected areas, and possibly the unborn of pregnant woman that have sexual contact with male partners that are infected with ZIKV due to recent travel to ZIKV affected country. On the 8 of February 2016, the South African Department of Health issued a travel advisory recommending that pregnant women avoid travelling to affected areas or if they have to travel, that they should strictly follow steps to avoid mosquito bites. The advisory also states that the NICD offers testing to patients with compatible symptoms returning from affected areas. In

addition, steps are being taken to reduce the risk of translocation of possible infected mosquitoes from ZIKV affected countries. On the 5 of February 2016, NDOH Environmental and Port Health department issued an alert to intensify surveillance and screening for ZIKV in points of entry. This includes a number of steps: 1) continued mosquito monitoring of arriving aircrafts and increased mosquito surveillance to ensure that aircraft are sprayed with insecticide; 2) assessment of ship sanitation to a) identify possible vector breeding areas; b) ensure that steps have been taken to minimize insect breeding, and c) to inspect ships for

presence of mosquito vectors; 3) continued thermal scanning of all travellers at ports of entry; 4) referral of travellers at points of entry with compatible symptoms to a health care facility for further management; 5) increased monitoring of imported used tyre casings and 6) increased health education and awareness to travellers about ZIKV disease.

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