

## 2 VECTOR-BORNE DISEASES

### a FOCUS FEATURE: Sindbis fever

#### Case report

A 14-year-old male residing in Johannesburg presented with a low-grade fever, and rash on his trunk, limbs and palms. He was receiving methotrexate and adalimumab (a TNF inhibitor) for rheumatoid arthritis. The rash was suggestive of Sindbis fever, with a characteristic appearance of pale halos surrounding papular lesions. He had been on a golf course in Johannesburg four days prior to the onset of illness; this was most likely where exposure to mosquitoes occurred. Serologic testing confirmed the clinical diagnosis with detection of anti-Sindbis virus antibodies by haemagglutination inhibition assay and IgM ELISA. The patient has made a complete recovery.

Sindbis fever is known to be endemic in South Africa, and is considered an underreported and underrecognised cause of rash-arthritis syndrome in our country.

#### Epidemiology

Sindbis virus was first isolated from *Culex* spp. mosquitoes collected in the village of Sindbis near Cairo in 1952. The same virus had already been isolated from a bird, but remained a 'virus without a disease' until the first description of clinical symptoms caused by a Sindbis virus infection was reported from Uganda in 1961. Sindbis virus is a mosquito-borne arbovirus, and is maintained in nature through an avian-mosquito transmission cycle; the main vectors are *Culex* spp. and *Culiseta* spp. mosquitoes. Humans and other vertebrates are occasionally infected, but no person-to-person transmission has been documented. Sindbis virus is one of the most widely distributed arboviruses, with infections and epidemics reported in Africa, Eurasia (particularly Scandinavia and former Soviet Union countries) and Oceania (including Australia). The distribution of the virus is linked to the migration pathways of several species of birds.

#### Clinical features

The incubation period is short - usually less than seven days. Asymptomatic and subclinical disease is

### FOCUS ON SINDBIS FEVER

thought to be common. The most prominent clinical manifestations of Sindbis fever include fever, fatigue, maculopapular rash, and arthralgia with or without arthritis. Other symptoms include myalgia, headache and nausea. The rash usually occurs on the trunk and limbs and may be distinctive, with a pale 'halo' surrounding the erythematous lesions (Figure 1). Arthralgia/arthritis most often occurs in wrist, hip, knee and ankle joints. In children, the disease is usually mild and can present without any joint symptoms. Extra-articular symptoms usually resolve within 1-2 weeks, but joint symptoms can persist for months or years, and in rare cases can result in chronic arthritis. No fatal cases of Sindbis fever have been reported to date.

#### Laboratory findings

Full blood count, ESR and CRP parameters are usually normal and uninformative.

#### Diagnosis

The laboratory diagnosis of acute Sindbis fever is based primarily on the detection of Sindbis virus antibodies by haemagglutination inhibition assay or ELISA. The detection of IgM antibodies, or IgG seroconversion between paired samples which have been taken two weeks apart, indicates recent Sindbis virus infection. However, it has been shown that up to 60% of Sindbis fever patients do not have detectable IgM antibodies within the first week of illness, and IgM testing may need to be repeated in such instances. Reverse transcription PCR and virus isolation from a serum sample are additional tests that may be useful. The Centre for Emerging and Zoonotic Diseases, NICD-NHLS offers testing for Sindbis fever.

#### Management

There is no specific antiviral treatment available for Sindbis fever. Treatment is symptomatic, and would include antihistamines for pruritic rashes and NSAIDs for joint symptoms.

### Prevention

The only preventive measure when living in or travelling in a Sindbis fever endemic area is to avoid being bitten by mosquitoes.

### Sindbis fever in South Africa

The first human cases of Sindbis fever in South Africa were diagnosed in 1963. Since then, Sindbis fever cases have been noted to occur annually during the summer across the central plateau, i.e. Gauteng, Free State and Northern Cape provinces, usually after heavy rainfall, which stimulates the expansion of the mosquito vector populations. A large epidemic in the Karoo and Northern Cape during 1974 affected thousands of people, and another large epidemic occurred in 1984 with hundreds of cases throughout the Pretoria-Witwatersrand area. For the period 2006-2010, a total of 229 laboratory-confirmed (IgM positive) Sindbis fever cases was documented by the Centre for Emerging and Zoonotic Diseases, NICD-NHLS.

Most cases were diagnosed in March and April, corresponding to the period during which *Culex univittatus* mosquitoes are abundant across the central plateau. The majority (86%) of cases were from Free State, Gauteng and Northern Cape provinces; however, except for Limpopo Province, cases were also reported from the other provinces. Since West Nile virus transmission in South Africa also involves avian hosts and *Culex univittatus* mosquito vectors, West Nile virus and Sindbis virus may co-circulate and cause outbreaks of human infections at the same time. This phenomenon of dual West Nile virus and Sindbis fever outbreaks has been documented numerous times in South Africa: across the Highveld in 1967 and again in 1984, and in the Karoo (Northern Cape and Free State provinces) in 1974 and 1976.

**Source:** Centre for Emerging and Zoonotic Diseases, and Division of Public Health Surveillance and Response, NICD-NHLS



**Figure 1. Typical Sindbis fever rash with pale 'halos' surrounding erythematous lesions**  
Photo courtesy of the late Dr B. Miller's collection (Sizwe Hospital)