

## **Sexual transmission of Zika virus**

From time to time, the world experiences challenges related to human health. Many of these problems first affect small populations in specific regions of the planet. Depending on the characteristics of the problem, the situation can spread all over the world. This is especially true in the current century with the huge frequency and speed of movement of people and cargo that may carry, unintentionally but effectively, vectors' agents and/or infectious disease originators. It is evident that upon arrival to a new region of the planet, the vectors' agents need favorable conditions to remain viable to new infections. In a new situation, the issue of reducing spread of an emerging infectious disease is aggravated when, in addition to the speed of geographic expansion described earlier, there is a lack of knowledge by the scientific community of aspects of transmission, physiopathology, diagnosis, and treatment.

Therefore, it is fully acceptable and justifiable that the problem of Zika virus (ZIKV) is being addressed as a global public health emergency by the World Health Organization. Although researchers initially characterized the disease as being transmitted by mosquito bite, with benign evolution and remission of symptoms in a few days, a strong association with microcephaly in conceptuses of many pregnant women with Zika manifestation was later noted. The triggering of Guillain-Barré syndrome — an autoimmune disease that can evolve severely in many cases of this arbovirus — was also observed. In addition, new findings with possible associations with Zika continue to arise.

Recent data showed the presence of ZIKV in blood, semen, urine, and saliva, which suggest that the virus could also be transmitted by these corporal fluids<sup>1-5</sup>. As of April 2016, sexual transmission of ZIKV has been documented in several non-endemic countries, such as Argentina, Chile, France, Italy, New Zealand, the United States, and Canada, during the 2015 outbreak<sup>5,6</sup>. ZIKV can be spread during sexual intercourse by a man infected with Zika to his partners. In some known case reports of sexual transmission, it is found that men had Zika symptoms. From these case reports, we know that the virus can be spread when the man has symptoms, before symptoms start, and after symptoms end because the virus can stay in semen longer than in blood<sup>3,4,7</sup>.

Sexual transmission of ZIKV has been suggested by Foy et al.<sup>8</sup>, who described a female patient infected with ZIKV once her husband returned from a trip to southeastern Senegal in 2008, after being infected during his travel. In addition, in December 2013, ZIKV RNA was detected in semen samples for a longer time than in blood and urine samples of a man in Tahiti who sought treatment for hematospermia during a ZIKV outbreak in French Polynesia. The man had experienced symptoms of ZIKV infection two and ten weeks before presentation with hematospermia, and the virus was isolated from semen samples three days after the hematospermia<sup>3</sup>. In 2014, in the United Kingdom, a 68-year-old man had onset of fever, marked lethargy, and an erythematous rash 1 week after returning from the Cook Islands. Serum samples taken 3 days into the febrile illness tested positive for ZIKV by RT-PCR. Semen was indicated positive by RT-PCR analysis, at 27

and 62 days after onset of febrile illness<sup>4</sup>. He had acquired the virus through sexual contact with an individual who returned from a country with the presence of ZIKV. Deckard et al. reported a case from Dallas County, Texas. It was a case of ZIKV transmission from an infected man to a sex partner through anal sex — a man with recent travel to an area of active ZIKV transmission and his nontraveling male partner<sup>9</sup>. In February, it was widely reported by the international media that the CDC was investigating the occurrence of 14 new cases of sexual transmission of ZIKV. However, no further details are available in the scientific literature.

### **STRONG ASSOCIATION OF ZIKV TRANSMISSION BY INTERCOURSE**

Therefore, we now have evidence of the strong association between ZIKV transmission and sexual intercourse, since there are already reports of the presence of viral RNA in body fluids, such as semen, urine, and saliva, in addition to blood. It will not be a surprise if in a few weeks we hear about reports of ZIKV found in vaginal fluid, cervical scrapings, and in research by swab of the anal canal. This may particularly be the case if secondary inflammatory/infectious processes are observed. It follows that the professionals who work in the sexually transmitted diseases area must be urgently aware and well informed about these new challenges. Disease transmission via intercourse is not as simple a matter as many people think. In general, multiple anatomical areas and bodily fluids are involved in intercourse and may include mouth, penis, saliva, semen, vagina, vaginal secretion, and anus. In many situations, invisible microtraumas, exfoliations, small fissures, and discrete bleeding facilitate infections in mucous and semimucous areas.

It is worth noting that the potential for infection by a sexually transmitted disease depends on the number of etiological agents in the infected partner and on the host resistance of the noninfected partner's immune system. Thus, it is logical to think that this equation changes often according to many variables of the carrier of the disease and of the exposed person. The occurrence of infection is especially variable if the exposed person already presents a local favoring situation, such as vulvar/vaginal candidiasis or a general condition such as pregnancy, as examples.

We experienced a similar situation at the beginning of the HIV epidemic in the 1980s. At that time, it was considered a disease of homosexual men. Many sectors of the world press, especially in North America, used to publish reports with the title of "Gay Cancer". Today, we know that there are multiple modes of HIV transmission in addition to sex practiced between men. We must be careful to avoid the same mistakes of the past in our understanding and discussion of disease.

With time, research based on strong evidence will give insight to the true dimensions of the ZIKV situation as it relates to intercourse and assisted reproduction. In case sexual transmission by men is confirmed by additional findings (currently, there are no

studies that indicate sexual transmission by women), prevention should be indicated when men infected with ZIKV have intercourse with people of either sex. Attention should also be given to the testing of donors of semen/ovule for ZIVK.

This must be the vision and the commitment of the professionals working in the area of sexually transmitted diseases. Moreover, the world urgently needs more specialized and involved experts conducting research and in clinical practice in this field to support safe and pleasurable sexual activity.

Before these reports, no arboviruses had been isolated from human semen. There are many unanswered questions and, for now, it is important to be cautious. There is no treatment and no vaccine for ZIKV and the recommendation of condom use and counseling are important to avoid sexual transmission. Even though, in endemic countries, it is not likely that sexual transmission is anywhere close to the frequency of mosquito-borne transmission of ZIKV.

PS: And every day we have access to new scientific knowledge.

In the final review of this editorial we learned of the case reported by Davidson et al<sup>10</sup>: Suspected Female-to-Male Sexual Transmission of Zika Virus - New York City, 2016.

The authors report that: this case represents the first reported occurrence of female-to-male sexual transmission of Zika virus. More, ongoing surveillance is needed to determine the risk for transmission of Zika virus infection from a female to sexual partners her.

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