

Isolation of viable Zika virus from spermatozoa

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In their recent study, Joguet et al isolated viable Zika virus (ZIKV) from the spermatozoa of a ZIKV infected individual. This is an important finding. It is possible that the presence of viable ZIKV in seminal plasma alone is insufficient for infection of the ovum or zygote/morula. The plasma membrane of an ovum is surrounded by a dense protective layer of glycoproteins called the zona pellucida (ZP). It is unknown whether ZIKV can bind to the ZP and then infect the ovum or zygote/morula. However, the fusion of a spermatid to the ZP and entrance into the ovum (the 'acrosome reaction') is a complex process (2). It requires binding of the spermatid to specific receptors on the ZP and the release of proteins that allow the spermatid to penetrate (2). Following fertilization of the ovum, these receptors inactivate, and the ZP remains for about 5-6 days (2). Thereafter, it degenerates and is replaced by an underlying layer of trophoblastic cells (2). Semen remains in the female reproductive tract (FRT) for approximately 5 days following intercourse. Thus, during this period the ZP may protect the zygote/morula from infection via viable ZIKV in the seminal plasma. Indeed, protection from infectious agents in semen and the FRT is one of the functions of the ZP (3). The ZP might also protect the zygote/morula from maternal viraemia, depending on the timing of fertilization and viraemia. However, the presence of viable ZIKV within motile spermatozoa is a route by which virus could infect the zygote/morula. For ZIKV, this would almost certainly lead to early embryonic miscarriage, if not severe fetal congenital disease. ZIKV is only one of many viruses that have been isolated from human semen however. For viruses which are capable of integrating into the host genome, there is a third theoretical consequence of their presence in spermatozoa: the transmission of virus-induced mutations to subsequent generations. This could lead to an increased risk of cancers and other disorders. A recent review identified that 27 different viruses across a broad range of families have been detected in semen (4). It is therefore important to know which viruses are capable of infecting spermatozoa, not only because of immediate effects on fertility and embryonic development but also long-term latent effects on the health of offspring.

We declare no competing interests.

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