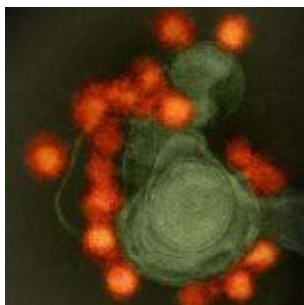


Can a vaccine prevent ZIKV associated fetal abnormalities ?



Approximately one third of fetal deaths, microcephaly or other fetal abnormalities of the central nervous system in Brazil (2016) were associated with maternal Zika virus (ZIKV) infection. Consequently, the World Health Organisation (WHO) has included ZIKV as one of the priority pathogens that require urgent effective countermeasures, particularly prophylactic ZIKV vaccines against fetal abnormalities.

Researchers from Germany aimed to determine whether measles-virus expressing Zika envelope protein E (MV-Zika-sE) sufficiently prevent fetal abnormalities. They hypothesised that live-attenuated measles-virus as vector would induce both humoral and cellular immunity. Induction of both arms of adaptive immunity would provide superior protection against ZIKV associated fetal abnormalities compared to purified formalin-inactivated virus ZIKV vaccine(ZIPV).

Vaccination with MV-Zika-sE induced IgG antibodies, which conferred neutralising activity against both ZIKV and measles virus. MV-Zika-sE also induced robust T cell responses, which produced IFN- γ and were associated with moderate proliferative potential. Thus confirming that MV-Zika-sE induced both humoral and cellular immunity, and can also induce anti-measles immunity.

Fetal abnormalities and microcephaly are one the complications of ZIKV infection during pregnancy. Researchers showed that maternal vaccination with MV-ZIKV-sE induced significantly higher levels of humoral immunity than ZIPV vaccination. This increased vaccine induced-humoral immunity was also associated with reduced ZIKV viraemia in MV-ZIKV-sE vaccinated dams. Additionally, vaccine induced immunity by MV-ZIKV-sE but not ZIPV resulted in lower occurrence of fetal abnormalities, such as near-normal birth weight, fetal size and placenta size. Additionally, in spite of detecting ZIKV RNA in 14 out of 71 MV-ZIKV-sE dams, none of the offspring had detectable ZIKV DNA in the brain.

In summary, researchers showed that MV-ZIKV-sE vaccination, induced superior humoral and cellular immunity than ZIPV vaccination. MV-ZIKV-sE induced immunity sufficiently retarded ZIKV replication in placenta, and reduced fetal abnormalities. Furthermore, induction of anti-measles immunity suggests that it can be co-administered as both an anti-ZIKV and anti-measles vaccine.

Journal Article: Nürnberger *et al.*, 2019. [A Measles Virus-Based Vaccine Candidate Mediates Protection against Zika Virus in an Allogeneic Mouse Pregnancy Model](#). Journal of Virology

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