

Safety and Immunogenicity of a Zika Purified Inactivated Virus (ZPIV) vaccine in Flavivirus Naïve and Japanese Encephalitis Virus (IXIARO™) or Yellow Fever (YF-VAX®) Primed Volunteers

Zika virus (ZIKV) infection can cause major birth defects and serious neurologic complications. A ZIKV vaccine is therefore an important global health priority. In this study we administered an experimental purified inactivated Zika vaccine (ZPIV), comprised of 5µg of formalin inactivated Zika virus with 500µg aluminum hydroxide gel adjuvant. We recruited 75 participants into three groups of 25, including a flavivirus naïve group, a Japanese encephalitis virus (JEV) vaccine (Ixiaro®) primed group and a yellow fever virus (YFV) vaccine (YF-VAX®) primed group. Five participants per group were randomly assigned to receive placebo. Priming vaccinations were given 72-96 days prior to receipt of ZPIV. ZPIV was administered in either two or three doses at days 0, 28 and 196-234. Vaccinations were well tolerated in all groups with only pain at the injection site occurring significantly more frequently in vaccinated subjects than placebo recipients (65% (51.6 -76.9) vs 21% (4.7-50.8)). An 88% (63.6-98.5) seroconversion rate and geometric mean neutralizing antibody titer (GMT) of 100.8 (39.7-255.7) was observed in the flavivirus naïve group 28 days following 2 doses of ZPIV. In the JEV and YFV primed groups the seroconversion rates (31% (12.6-56.6) and 25% (8.7-49.1), respectively) and GMTs (11.8 (6.1- 22.8) and 6.6 (5.2-8.4), respectively) were significantly lower at the same time point. All groups demonstrated a substantial boost following a third dose, with seroconversion rates of 100%(69.2-100), 93% (66.1-99.8) and 60% (32.2-83.7) and GMTs of 511 (177.6-1473.6), 174 (51.6-587.6) and 79 (19-326.8) for the flavivirus naïve, JEV primed, and YFV primed groups, respectively. ZPIV is a safe and immunogenic vaccine candidate that may be a potentially effective countermeasure for ZIKV infection. A third dose is likely required to generate a durable immune response. Significant immune interference may occur between ZPIV and related YFV and JEV vaccines following the first and second ZPIV doses.

Disclaimer

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