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Title: MenB/Gonococcal Vaccine to prevent colonization and disease Authors: Serena Giuntini*, Alejandro D. Bolanos, Scarlet W. Tefera and Gregory R. Moe OMVax, Inc, San Francisco, CA *Presenter

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Background

MenACYW conjugate vaccines are not only protective against disease but also cost effective because they also prevent colonization thus providing community immunity in addition individual protection. We have developed a vaccine based on meningococcal native outer membrane vesicles containing overexpressed, mutant Factor H binding proteins from subfamilies A and B with reduced FH binding and attenuated endotoxin (NOMV-FHbp). Previously, we had shown that a prototype vaccine elicited serum bactericidal activity (SBA) against diverse MenB subfamily B strains in infant macaques but also SBA against gonococcal strains. In this study, we investigated the ability of antibodies elicited in mice by NOMV-FHbp to mediate SBA and prevent colonization by MenB and N. gonorrhoeae (Ng) strains in in vitro and in vivo models.

Aim/Methods

CD1 mice or human CEACAM1/FH transgenic (Tg) mice were immunized with two or three doses of a vaccine containing NOMV-FHbp adsorbed to AlOH3. Antisera were tested for FHbp-specific IgG by ELISA, and for SBA against Ng and diverse MenB strains. The effect of NOMV-Fhbp vaccine on MenB colonization was tested in Tg mice challenged with a heterologous MenB strain and Ng in an in vitro adhesion assay with human ME180 cervical cancer cells.

Results

Mice immunized with NOMV-FHbp or recombinant FHbp had similar IgG responses against subfamily A and B FHbps even though the amount of FHbp in NOMV-FHbp was 100-fold lower. NOMV-FHbp anti-sera from CD1 mice showed similar or greater SBA compared to licensed MenB vaccines against a panel of MenB strains

irrespective of matching (100%) or mismatching (≥87%) FHbp sequences. Human FH Tg mice had higher SBA titers when immunized with the NOMV-FHbp vaccine compared to licensed MenB vaccines (P≤0.01). NOMV-FHbp decreased CFU in the nasopharynx in MenB challenged Tg mice compared to controls (P=0.02). Anti-NOMV-FHbp also had SBA titers ≥1:5 against Ng strains and inhibited adhesion to ME180 cervical cells compared to control (P=0.0071).

Conclusions

In mice, the NOMV-FHbp vaccine was more effective than currently licensed MenB vaccines and decreased colonization in Tg and cervical cell models demonstrating a potential to provide both individual and community immunity against MenB and gonorrhea.