Evaluation of Immune Responses in Foals Post-Vaccination With a West Nile Virus Vaccine (Live Flavivirus Chimera)

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Vaccinating 5-mo-old foals with a single dose of a West Nile virus chimeric vaccine in the presence of maternal antibodies to West Nile Virus does induce a cell-mediated immune response. This response is indicative of an immunologically protective Th-1 response with stimulation of cytotoxic T lymphocytes. Authors' addresses: 160 Towne Square Park, Lexington, KY 40511 (Gutierrez); Hagyard Medical Institute, 4250 Ironworks Pike, Lexington, KY 40511 (Brown); University of Florida, College of Veterinary Medicine, Department of Large Animal Clinical Sciences, PO Box 100136, Gainesville, FL 32610 (Long); and Maxwell H. Gluck Equine Research Center, Department of Veterinary Science, University of Kentucky, Lexington, KY 40546 (Horohov); e-mail: David.Horohov@uky.edu. © 2008 AAEP. *Presenting author.

1. Introduction
In this study, we investigated the foal's immune-system response to a chimeric West Nile Virus (WNV) vaccine to better understand the immunity that is conferred post-vaccination. Additionally, we studied how maternal antibody interference affects vaccination with a chimeric WNV vaccine. This provides valuable information to practitioners in terms of when to administer such preparations in an effort to maximize the immune response in foals.

2. Materials and Methods
Serum titers, cell-mediated cytokine parameters, and in vitro stimulation of peripheral blood mononuclear cells (PBMC) were performed on 40 3- and 5-mo-old foals post-vaccination with a WNV chimeric vaccine. Age-dependent controls were also sampled.

3. Results
A significantly (p < 0.05, repeated measures-analysis of variance [RM-ANOVA]) increased granzyme B expression was detected in the 5-mo-old vaccinated foals. WNV-stimulated PBMC from the 5-mo-old foals exhibited a significantly increased expression of IL-2, perforin, and TGF-β compared with non-vaccinated controls; additionally, a trend with IFN-γ was observed. A significant titer response post-vaccination was not detected.

4. Discussion
This study shows that vaccinating foals with a single dose of a chimeric WNV vaccine in the face of maternal antibodies does produce a cell-mediated response that is indicative of a Th-1 mediated response with stimulation of cytotoxic T cell activity.
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Footnote