Does Vaccination of Young Foals Against Equine Influenza in the Presence of Maternal Antibodies Increase Resistance or Susceptibility to Infectious Challenge?

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Vaccinating young foals against equine influenza in the presence of maternal antibodies did interfere with the induction of protective immunity. Although neither of the vaccines tested seemed to induce protective immunity in the vaccinated foals, they did not exacerbate the infection nor alter the serological response post-challenge. Authors’ address: Gluck Equine Research Center, Department of Veterinary Science, University of Kentucky, Lexington, KY 40546-0099; e-mail: Tracy.Sturgill-Wright@uky.edu. © 2008 AAEP.

1. Introduction
Foals obtain all of their maternally derived antibodies from the ingestion of colostrum. Failure to acquire these antibodies can lead to significant health risks. Paradoxically, maternal antibodies can interfere with antibody production by the foal. Although various studies have reported on the effect of maternal interference on the serological response to vaccination, we are not aware of any studies that have examined this issue using an experimental challenge.

2. Materials and Methods
Foals born to equine influenza virus-vaccinated mares received an inactivated equine influenza, a vectored vaccine, or no vaccine. Serological responses were measured post-vaccination. The foals were challenged with equine influenza virus, and clinical signs were recorded. Post-challenge antibody responses were also measured.

Vaccinated and non-vaccinated yearlings were also included for comparison during the challenge study.

3. Results
All foals had high maternal antibody titers to equine influenza virus pre-vaccination. Vaccination of the foals with either vaccine failed to induce an increase in hemaglutinin inhibition (HI) titers. After challenge, there were no significant differences between the vaccinated and the control foals in terms of clinical response, virus excretion, or antibody production. By contrast, the yearlings both responded to the vaccine and were protected from the challenge.

4. Discussion
Maternal interference of antibody production has been shown for equine vaccines. There are several reports that vaccination of foals for influenza in the
face of maternal antibodies could induce tolerance. Here, we show that in contrast to the vaccinated yearlings, young foals born to seropositive dams failed to respond to either vaccine. This is consistent with previous reports of interference by maternal antibodies. Although the yearlings were protected by the vaccines, there was considerable individual variation in response to challenge infection among foals. Foals in each vaccine group were protected from the challenge, but this was not statistically different from the controls. All foals developed antibodies post-challenge; however, the yearlings exhibited significantly elevated titers compared with the weanlings. Although vaccination for influenza in the face of maternal antibodies failed to protect, it did not induce tolerance.