Duration of Immunity to Equine Influenza Virus Resulting From Canarypox-Vectored Vaccination

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Vaccination with a canarypox-vectored equine influenza vaccine provides protection of at least 6-mo duration against a severe influenza virus challenge model infection. Bi-annual vaccination is therefore likely to provide high levels of protection for horses exposed to infection. Authors’ addresses: Department of Clinical Sciences, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, 300 West Drake Road, Fort Collins, CO 80523 (Hussey, Lunn); Merial, SAS 254 rue Marcel Merieux, 69007 Lyon, France (Minke); School of Veterinary Medicine, Iowa State University, Ames, IA 50010 (Jagannatha); and Merial Limited, 6498 Jade Road, Fulton, MO 65251 (Hunter); e-mail: David.Lunn@Colostate.edu. © 2007 AAEP. *Presenting author.

1. Introduction
Equine influenza virus circulates continuously in the horse population in North America and in many other countries, despite extensive use of vaccinations. Many factors determine the efficacy of vaccination, but the potency of the immune response to vaccination is critical to the duration of immunity. This study was designed to determine the duration of immunity to canarypox-vectored equine influenza vaccine over a 6-mo period.

2. Materials and Methods
Twenty-three influenza-naïve 6-mo-old pony colts were assigned to a vaccine (n = 12) or control (n = 11) group, and the vaccine group was vaccinated twice, at a 35-day interval, IM, using a canarypox-vectored equine influenza vaccine.a Six months after the second vaccination, all ponies were challenged with a nebulized aerosol containing 10⁸ EID₅₀ (Egg Infectious Dose 50%) influenza virus A/eq/Kentucky/91. Clinical signs and virus shedding were studied for 14 days after challenge. Serological responses to vaccination and challenge infection were studied for the entire experimental period. Viral shedding was measured using a real-time reverse transcriptase-polymerase chain reaction (RT-PCR) assay. The investigators were blinded to the group assignment of the ponies. Statistical comparisons were made using parametric and non-parametric analyses, with statistical significance reported when p < 0.05.

3. Results
Vaccinated ponies generated high-titered anti-influenza virus antibody responses to vaccination and showed statistically significant protection from challenge infection as determined by duration and extent of pyrexia, clinical score, and loss of body weight. Viral shedding occurred in both groups but at a significantly lower amount in the vaccination
group on most days. The challenge infection produced unusually severe signs in ponies in the control group, with 7 of 11 ponies requiring therapy with non-steroidal anti-inflammatory drugs and antibiotics. One of these ponies was euthanized because of severe respiratory distress, and post-mortem examination revealed severe interstitial pneumonia.

4. Discussion

This level of protection against a severe challenge model predicts that vaccination against equine influenza virus infection using canarypox-vectored vaccine can provide excellent protection lasting 6 mo, even in young, unprimed equids. The real-time RT-PCR influenza virus assay demonstrated excellent utility for quantitating viral shedding.

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Footnote

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