Does Equine Pituitary Pars Intermedia Dysfunction Affect Immune Responses to Vaccination?

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Pituitary pars intermedia dysfunction (PPID) horses compared to non-PPID responded immunologically the same to the equine influenza virus component of the vaccine; however, there were some differences in immune response measured to the equine herpes virus and West Nile virus component of the vaccine. Authors’ addresses: 108 Gluck Equine Research Center, University of Kentucky, Lexington, KY 40546 (Adams, Siard, Reedy); Boehringer Ingelheim Vetmedica, Inc., 3902 Gene Field Road, Saint Joseph, MO 64506 (Grubbs); and 2320 Forde Mill Road, Paris, KY 40361 (M. Little, J. Little); e-mail: amanda.adams@uky.edu. *Corresponding and presenting author. © 2014 AAEP.

1. Introduction

Over the past decade the aged horse population has significantly expanded with 20 to 30% of the equine population comprised of geriatric horses (≥20 years) and, of these horses, approximately 30% are affected by pituitary pars intermedia dysfunction (PPID), a progressive and debilitating endocrine disease. Along with advancing age, there is a decline in immune function, but currently there are no specific recommendations regarding vaccination of older horses, nor those affected by PPID. Furthermore, it remains to be determined if PPID affects immune responses to vaccination. Thus, the objective of this study was to determine if horses with PPID compared to non-PPID aged match controls would respond immunologically differently to vaccination.

2. Materials and Methods

A total of 33 aged horses of mixed sex and breeds were used in this study. All horses were pre-screened to determine equine influenza virus (EIV) antibody titers and PPID status based on responses to a dexamethasone suppression test (DST) and a thyrotropin releasing hormone (TRH) stimulation test. Furthermore, all horses were assigned a numeric value for severity of clinical signs (hair coat, muscle condition, etc.) of PPID by two blinded DVMs, via an established scoring system. Non-PPID horses were characterized by cortisol levels (≤0.2 ug/dL) at 19 hr post-DST and adrenocorticotropic hormone (ACTH) levels (≤35 pg/mL) pre-TRH stim and ACTH levels (≤110 pg/mL) at 10 min post-TRH stim test. The PPID horses were further characterized by either double positive (DP) [DST no suppression and pre-TRH ACTH (≤35 pg/mL) and 10 min post-TRH (≥110 pg/mL)] or single positive (SP) [DST suppression but pre-TRH ACTH (≥35 pg/mL) and 10 min post-TRH (≥110 pg/mL)] responders. Treatment groups were randomly blocked according to these measures, along with age,
to the following vaccinate groups: (group 1) non-PPID horses, vaccinated IM\textsuperscript{a} ($n = 12$), (group 2) non-PPID controls, receiving a sterile saline vaccination ($n = 3$), (group 3) PPID horses (DP, $n = 7$; SP, $n = 7$) vaccinated,\textsuperscript{a} and (group 4) ($n = 6$) PPID horses receiving sterile saline vaccine (DP, $n = 2$; SP, $n = 2$). Peripheral blood for antibody titer measures to EIV, equine herpesvirus (EHV)-1, and West Nile virus (WNV) were collected prior to the first vaccination (week 0) and again at week 2 and 4 post-vaccination. A second vaccine\textsuperscript{a} or saline control was given at week 4 and blood collected at week 6 and week 8 post-vaccination.

3. Results

The results indicated that all horses receiving vaccination responded significantly with an increase in EIV and EHV-1 antibody titers post-vaccination. Furthermore, the results indicated that there was no significant difference in EIV antibody titers vaccinations between non-PPID and PPID horses; however, there were significant ($p < 0.05$) differences in EHV-1 and WNV humoral immune responses among the PPID horses.

4. Discussion

This is the first study to determine the effects of PPID on immune responses to routine vaccination.

Acknowledgments

Conflict of Interest

This project was funded by Boehringer Ingelheim Vetmedica.

Footnote

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