Effects of a canine gonadotropin releasing hormone (GnRH) vaccination on male llamas
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Introduction: GnRH is produced in the hypothalamus and regulates the secretion of luteinizing hormone, which is necessary for testosterone production. Immunization against GnRH causes declines in testosterone concentration [T] in horses,1 swine,2 cats,3 sheep,4 cattle5 and dogs.6 The aim of this study was to determine the efficacy of a canine GnRH vaccine in llamas for immunocastration. The hypothesis was that GnRH vaccination would decrease [T].

Materials and methods: Mature, intact male llamas received three (3-mL) intramuscular injections of either Canine Gonadotropin Releasing Factor Immunotherapeutic® vaccine (Pfizer Animal Health, Exton, PA; n=7) or an equal volume of sterile diluent provided by the vaccine manufacturer (placebo; n=7) at three week intervals. Jugular venous blood samples were collected every three weeks for 12 weeks. Serum GnRH antibody titers were determined by an enzyme linked immunosorbent assay. Serum [T] were measured using a double antibody radioimmunoassay (Diagnostic Products Corporation, Los Angeles, CA). The assay sensitivity was 0.04 ng/mL. Intra-assay and inter assay CVs were <10%. All of the samples were tested within one assay.

Results: No GnRH antibodies were detected at the time of vaccination or at any later time point in the placebo-treated llamas. Low GnRH antibody titers (1:16-1:256) were detected at 3, 6, 9 and 12 weeks in 2, 5, 6, and 4 of the vaccinated males, respectively. In vaccinated males, mean [T] were inversely related to the geometric mean GnRH antibody titer (Figure 1). However, mean [T] did not differ significantly between treatment groups at any time point.

Conclusion: The response to this GnRH vaccination protocol was an inconsistent, short-lived, modest humoral response resulting in minimal androgen suppression. The reason for different responses to immunization among llamas is not clear. Further investigation on the effects of dose and frequency of immunization is needed.

Keywords: Gonadotropin releasing hormone, immunocastration, llama, testosterone, vaccination

References:

Figure 1. [T] versus GnRH antibody titer