Effects of Altrenogest on Behavior and Reproductive Function of Stallions

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Administering altrenogest to mature stallions at the labeled dosage (0.044 mg/kg) for 30 days had no effect on spermatozoal quantity or quality, with only minimal effects on stallion behavior at 30 days following treatment. However, this regimen of altrenogest significantly suppressed blood plasma concentrations of luteinizing hormone, testosterone, estrogen conjugates, and inhibin at the end of the treatment period. Authors’ addresses: Depts. of Anatomy and Public Health (Johnson) and Large Animal Medicine and Surgery (all other authors), The Texas Veterinary Medical Center, Texas A&M University, College Station, TX 77843. © 1997 AAEP.

1. Introduction

Previous studies involving stallions and males of other species suggest that treatment with altrenogest may have adverse effects on reproductive performance.1–3 No reports exist regarding the effects of altrenogest in stallions, when administered at the label dosage. In addition, neither the effect of altrenogest on aggressive behavior nor the reversibility of the treatment has been critically studied. This study was designed to determine the effects of administering altrenogest to mature stallions at the labeled dosage (0.044 mg/kg) for 30 days on the breeding and aggressive behavior of mature stallions, the spermatozoal quality and quantity of mature stallions, and the reversibility of the effects of altrenogest administration.

2. Materials and Methods

Eight mature stallions were selected based on age (≥5 years), body condition, and satisfactory classification as breeding prospects, as determined by laboratory-based breeding soundness examinations at the Texas Veterinary Medical Center. All stallions were acclimated to breeding shed and behavioral trial procedures for a 2-week period prior to the initiation of the experiment. The stallions were randomly divided into two blinded treatment groups: (a) a control group that received a placebo (Neobee M5 oil) and (b) a treatment group that received altrenogest (0.044 mg/kg) PO q 24 h for 30 days. Stallions were evaluated from 23 days prior to the initiation of treatment until 60 days following the cessation of treatment.

The experimental endpoints included the following: (a) behavioral measures of stallions exposed to common nonexperimental stallions, including latency to the first undesirable reaction and the number and type of undesirable reactions; (b) behavioral measures of stallions exposed to a common estrous tease mare and a common ovariectomized mount mare in a breeding-shed environment, including latency to erection, latency to first mount, la-
tency to ejaculation, number of mounts, number of ejaculation and nonejaculation thrusts, total time required in the breeding shed to obtain an ejaculate, total amount of required tease time, total amount of mounting time, number of flehmen responses per minute of tease time, and number of ejaculation and nonejaculatory tail flags; (c) spermazooal motility, morphology, and daily output; and (d) concentrations of follicle-stimulating hormone (FSH), luteinizing hormone (LH), testosterone, estrogen conjugates, and inhibin.

The effects of treatment were analyzed for significance (p < 0.05) by using a paired t test to compare the mean differences of dependent variables before and after treatment. This statistical analysis was selected to correct for wide variation among individual stallions for the measured parameters, thereby increasing the sensitivity of the test.

3. Results
The control stallions were used to account for non-treatment factors, such as environmental temperature and season. The mean differences between parameters before and after treatment were not significant in the control stallions.

The mean differences between daily spermazooal output, spermazooal morphology, and spermazooal motility parameters before and after treatment were unaffected by altrenogest treatment. The administration of altrenogest to stallions did not affect any of the stallion–stallion interaction endpoints tested during the course of treatment. However, 30 days following the cessation of treatment, the number of strikes was reduced when compared with pre-treatment values by a mean difference of 3.0 strikes (p = 0.01). The number of strikes returned to pre-treatment values by 60 days after treatment was discontinued. Treatment of stallions with altrenogest did not reduce any stallion–mare interaction endpoints tested during the course of treatment. Thirty days following cessation of treatment, however, latency to first mount and total time required to obtain an ejaculate were significantly decreased when compared with pretreatment values by mean differences of 18.6 s and 95.8 s, respectively (p < 0.05). These two stallion–mare behavioral endpoints returned to pretreatment values by 60 days following cessation of treatment.

Mean plasma concentrations of FSH were not affected by altrenogest treatment. However, mean plasma concentrations of LH, testosterone, estrogen conjugates, and inhibin were significantly suppressed at the end of the treatment period when compared with pretreatment concentrations by mean differences of 3.2, 0.79, 118.6, and 1.7 ng/ml, respectively (p≤0.04). LH, estrogen conjugates, and inhibin concentrations returned to pretreatment values by 30 days after cessation of treatment, whereas testosterone remained significantly suppressed for 60 days after the treatment was discontinued (p = 0.004).

4. Discussion
The treatment of stallions with altrenogest for 30 days at the label dosage had no effect on semen quality or quantity, and only minor effects on stallion behavior. From the evaluation of plasma hormonal concentrations, we hypothesize that altrenogest inhibited the release of LH from the pituitary gland. It is likely that this suppression of LH resulted in a lack of stimulation of Leydig's cells within the testes, resulting in lowered circulating concentrations of testosterone, estrogen conjugates, and inhibin. We postulate that these suppressions in hormone concentrations were shorter in duration and smaller in magnitude than that required to inhibit spermatogenesis and suppress aggressive and breeding behavior in mature stallions.

This research was generously supported by the Texas Racing Commission and the Department of Large Animal Medicine and Surgery, Texas A&M University. The altrenogest was donated by Hoechst Roussel Vet and the Neobee M5 oil was donated by the Stepan Company.

References and Footnotes

aRegu-Mate, Hoechst Roussel Vet, Route 202-206, Somerville, NJ 08876-1258.
SAS, SAS Institute, Inc., SAS Campus Dr., Cary, NC 27513.