Efficacy of Prepartum and Postpartum Domperidone Treatment on Fescue Toxicosis in Gravid Mares

D. L. Cross, PhD; J. M. Kouba, MS; T. Gimenez, DVM, PhD; D. H. Henricks, PhD; M. P. Reid, DVM; and E. A. Salley, DVM

Domperidone was effective in the treatment of fescue toxicosis in gravid mares. While grazing endophyte-infected (E1) fescue, domperidone-treated mares foaled near their expected foaling date without thickened placentas or foaling difficulty, and they had adequate milk. Foals had adequate serum IgG levels and appeared normal and vigorous. The treatment of mares for 10 days postpartum with domperidone resulted in trends toward increased mare and foal weights. Authors’ addresses: Creek Run Veterinary Clinic, P.O. Box 2929, Pendleton, SC 29670 (Reid and Salley) and Dept. of Animal and Veterinary Sciences, Clemson University, 150 Plant and Animal Bldg., Clemson, SC 29634-0361 (all other authors). © 1997 AAEP.

1. Introduction
Results of previous research at our station showed that mares grazing endophyte-infected (E+) pastures had increased gestation lengths (27 days), mare and foal deaths, agalactia, retained placentas, and placental weights and thicknesses. Also, serum estradiol levels were higher and total progestogens and prolactin levels were lower for E+ mares than for mares grazing endophyte-free (E-) pastures. In subsequent studies, neither supplemental energy, selenium injections, nor phenothiazine supplementation were effective in relieving any of the signs of equine fescue toxicosis. Our research indicated that the alkaloids of E+ fescue are dopamine agonists and that a D2 dopamine receptor antagonist, domperidone, would block their effects at the cellular level in rat pituitary cells. Unlike other D2 dopamine receptor antagonists, domperidone does not cross the blood-brain barrier. Therefore, domperidone does not elicit central nervous system neuroleptic side effects. Tall fescue is grown on more than 35 million acres in the U.S., and equine fescue toxicosis is a significant problem in the equine industry. The objective of this research was to determine the effect of prepartum and postpartum domperidone treatment on fescue toxicosis in gravid mares.

2. Materials and Methods
Treatment groups were as follows: endophyte-free fescue control (E-, n = 5), endophyte-infected fescue control (E+, n = 6), E+ with oral domperidone paste beginning 25 days before the expected foaling date with discontinuation of domperidone at foaling (D-0, n = 6), and E+ with oral domperidone paste beginning 25 days before expected foaling date with continuation of treatment through 10 days past
foaling (D-10, n = 6). Treatment was assigned to mares by breed (Quarter Horse and Arabian), parity, and expected foaling date in a completely randomized design. Domperidone was administered by mouth daily at 1.1 mg/kg of body weight in a molasses-based carrier. Control mares received placebo molasses according to their body weights. As a way to prevent pain and suffering from dystocia in the E+ treatment, these mares were withdrawn from E+ pastures at 7 or 12 days past expected foaling and started on daily domperidone therapy to initiate recovery.

3. Results
Gestation length was not affected (p > 0.05) by treatment with E-, E+, E+D-0, and E+D-10 mares going 6, 9, 3, and 5 days past expected foaling, respectively. The 10-day mare and foal postpartum weight gain was as follows: E- (11.2 and 14.9); E+ (10.5 and 10.6); E+D-0 (13.0 and 16.0); E+D-10 (25.5 and 18.9) kg/animal. Mammary scores and prepartum progestogen concentrations were greater (p < 0.05) for domperidone-treated mares than for E+ mares. Prepartum serum estradiol levels were greater (p < 0.05) for E+ mares than for the domperidone-treated mares. Prepartum serum prolactin concentrations were greater (p < 0.05) for domperidone-treated mares than for E- and E+ mares. Postpartum mare and foal serum progestogen, prolactin, and estradiol levels were not different (p > 0.05) among treatments. Milk composition (total solids, fat, and protein) was not different (p > 0.05) among treatments. All E-, E+D-0, and E+D-10 mares had live, healthy foals (0% mortality) and the foals survived through the 10-day postpartum period. Two of the six E+ mares foaled before their expected foaling date. Both foals were born alive. However, one foal was euthanized 1 day postpartum as a result of extreme weakness and complete agalactia in the mare. Only 50% of the E+ foals survived until 10 days past foaling. With the exception of one foal that was born as a twin, all domperidone-treated foals had adequate serum IgG levels (greater than 800 mg of IgG per 100 ml of serum).

4. Discussion
Based on previous research at our station,1 there would have been a high rate of dystocia, agalactia, mare mortality, and foal mortality when mares were left on E+ fescue up to foaling. In this study, domperidone mares were not removed from fescue through 10 days past foaling, all mares and foals survived (one foal born as a twin was euthanized at birth), and there was no agalactia or dystocia. The efficacy of this drug for the treatment of equine fescue toxicosis is further evidenced by the mammary gland development and serum hormone levels that were similar to E- control mares. The increased prolactin levels seen in the domperidone-treated mares is indicative of the D2 dopamine receptor blocking effect of the drug and the subsequent reduction in dopamine and fescue alkaloid interaction with those receptors. Domperidone treatment does not change the mare’s milk composition. The trend toward increased foal gains during the 10-day postpartum period and current research in progress suggest that domperidone may increase milk production in some low milk-producing mares.

This research is dedicated to the memory of Elizabeth A. Salley, who died on March 7, 1997. The use of domperidone in gravid mares offers much potential for relief of pain and suffering. Dr. Salley exemplified all aspects of the Veterinarian’s Oath, especially “the relief of animal suffering.” Therefore, it is appropriate that this research be dedicated to her memory.

References and Footnotes