RESPONSE OF RACE HORSES WITH GASTRIC ULCERS TO AN ARGININE DERIVED NITRIC OXIDE SUPPLEMENT

SUMMARY:

Fifty-one Thoroughbred race horses in race training and competition were identified to have active gastric ulcers and were enrolled in a study to determine the effect of an arginine-derived nitric oxide (ADNO) supplement on gastric ulcer healing. An experienced, independent veterinary clinician diagnosed and monitored these individuals throughout the study via gastroscopic examination. Study horses received a proprietary ADNO preparation top-dressed on feed for the duration of the study. 42 horses completed the study, 38 of which (90.5%) were ulcer free or improved. No adverse effects were noted.

INTRODUCTION:

Equine gastric ulcer syndrome (EGUS) is increasingly recognized as a pervasive, industry-wide health issue. Incidence is highest in those individuals involved in athletic competition and/or maintained in high stress environments [1]. Various substances are currently used to treat EGUS, most of which involve suppression of gastric acid production and have the obvious disadvantage of interfering with normal digestive function.

A proprietary nutraceutical preparation utilizing ADNO has been proposed as an effective alternative to current treatment protocols and was subjected to scrutiny in this study.

MATERIALS AND METHODS:

Fifty-one Thoroughbred race horses between the ages of 3 and 6 years from the stables of 16 trainers at Santa Anita Park racecourse were involved in the study. All horses continued in active training and racing throughout the study. No attempt was made to alter training, feeding or medication regimens. Horses were accepted

into the study regardless of severity of the ulcers involved. Candidates were selected by their trainers for initial examination due to a variety of reasons including poor health, poor performance, and failure to respond to other therapies.

All individuals underwent fasting gastroscopic examination by an experienced veterinary clinician prior to initiating treatment with the ADNO supplement. They were reexamined at approximately 30 and 120 days. All examinations were performed by the same veterinarian. The presence of ulcers was graded on an industry standard scale of 0 to 4.

Standard treatment consisted of 1 oz. of a proprietary ADNO nutraceutical preparation, top dressed on feed, for the duration of the study. One individual received 1 oz. twice daily for the first fifteen days and seven individuals received 1 oz. twice daily for the first ten days of the trial. All others received 1oz. per day throughout the study.

Horses were deemed to have completed the study if they were ulcer free or improved at day 30 or if unimproved at day 30 were available for continued treatment and reexamination at day 120. Horses were deemed improved if the ulcer severity level had decreased by at least one grade level. Nine individuals, unimproved at day 30, were lost to the study between the 30 and 120 day exams and were not included in the final totals.

DISCUSSION:

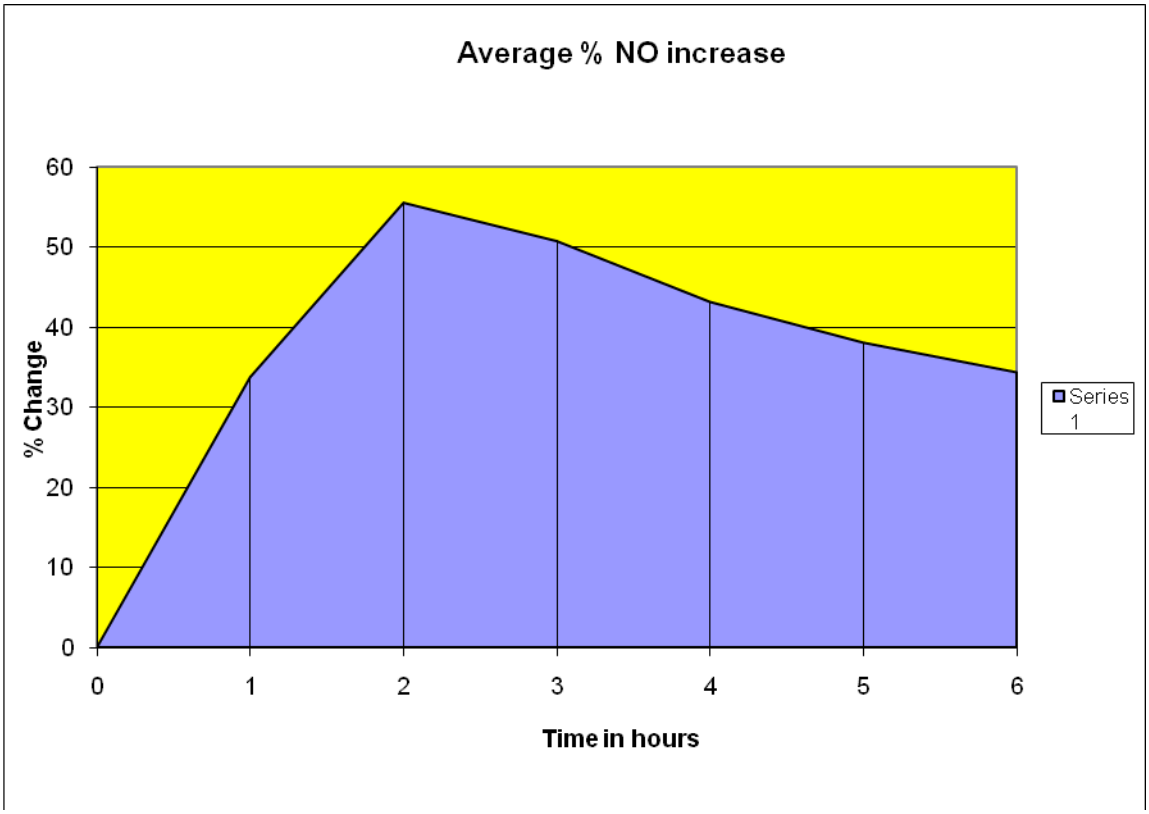
EGUS is an often painful and sometimes debilitating condition which diminishes athletic performance and overall health and vitality. Most current therapies attempt to reduce gastric acid secretion and are suspected of having long term deleterious effects on digestion and overall health. Conversely, the ADNO formulation investigated in this study has no known suppressive effect on gastric acid production and, to the contrary, increases protective mucus secretions.

Studies demonstrate that Nitric Oxide (NO) interacts with prostaglandin sensory neuropeptides in the regulation of mucosal integrity, influencing such factors as mucus secretion, mucosal blood flow and ulcer repair [2]. NO also has the capacity to down grade inflammatory responses in the gastrointestinal tract, to scavenge

various free radical species and to protect the mucosa from injury induced by topical irritants [3]. NO is synthesized from L-arginine, an essential amino acid in the human fetus and neonate, which plays versatile key roles in nutrition and metabolism [4]. Its beneficial properties in improving reproductive, cardiovascular, pulmonary, renal, liver and immune functions and in facilitating wound healing have also been shown [5].

ADNO therapy has been poorly utilized because of the extremely short half-life of the NO molecule, however, the ADNO formulation used in this study has been shown to elevate equine serum NO levels for over six hours from a single oral dose [6].

Sustained Release Nitric Oxide Delivery



Percentage change in serum nitric oxide levels over base as measured by nitric oxide metabolites following a one ounce oral dose of NitrOxide.

RESULTS:

38 of 42 horses (90.5%) completing the study were ulcer free or improved. The eight horses that received twice daily loading doses were all ulcer free or improved at day 30 (100%). Of the 34 remaining, 32 were ulcer free or improved at 120 days (94.1%). 27 of 42 horses (64.3 %) that received 1oz. of ADNO from the beginning of the study were ulcer free or improved at 30 days. The average ulcer score of all horses entering the study was 3.21. The average score following treatment completion was 1.29. Nine horses, unimproved at day 30, were lost to the study for follow up examination and were excluded from all study totals. No adverse affects of supplementation with the product under investigation were reported by the veterinarian or the trainers involved.

CONCLUSIONS:

The proprietary ADNO formulation used for treatment of EGUS in this study had a beneficial effect on the severity of gastric ulcers in 90.5% of the horses completing the study and appears to be a viable alternative to other therapies. Horses receiving a twice daily loading dose for ten days responded more quickly to treatment than those treated without a loading dose.

ACKNOWLEDGMENTS:

Vincent A. Baker DVM, of Equine Medical Center located in Cypress California, performed all of the gastroscopic examinations and ulcer grading involved in this study. Dr. Baker is an Equine practitioner serving the Southern California racing industry; Santa Anita, Hollywood Park, Del Mar Park and other racing facilities.

Gerald K. Huff DVM prepared the manuscript presented herein. Dr. Huff is an equine practitioner and consultant residing in Nevada.

Equine Science Solutions is the distributor of GastroPLUS PRO, the ADNO supplement utilized throughout this study.

Inquiries regarding this product or this study should be directed to Equine Science Solutions at 888-917-8565 or info@EquineScienceSolutions.com. Their web site is www.EquineScienceSolutions.com

REFERENCES;

1. Murry, M.J., et al, *Gastric Ulcers in Horses: "A Comparison of Endoscopic Findings in Horses With and Without Clinical Signs"*, Equine Veterinary Journal Supplement, 1999 (June): (7): 68-72.

2. Marti'n, M.J., Jimenez, M.D., et al, *"New Issues About Nitric Oxide and its Effect on the Gastrointestinal Tract"*, Curr. Pharm. Des. 7,881-908.

3. Gaboury, J., et al, *"Nitric Oxide Prevents Leukocyte Adherence Role of Superoxide"*, American Journal of Physiology. 65, H862-867.

4. Kirk, S.T., *"Arginine Stimulates Wound Healing and Immune Function in Elderly Human Beings"*, Surgery 114, 155-159.

5. Wu, G., et al, *"Arginine Nutrition in Development, Health and Disease"*, Current Opinion Metabolic Care 3, 59-66.

6. "*Sustained Release of Arginine Derived Nitric Oxide in Horse's*, Unpublished data, Huff, G. DVM & Fogli, R. November, 2010.