Effect of Different Treatment Modalities on Spinal Nociceptive Thresholds in Horses

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A single application of chiropractic treatment and massage therapy both produced significant increases in spinal mechanical nociceptive thresholds within asymptomatic horses. Pressure algometry provides an objective tool to evaluate commonly used but currently unproven treatment modalities for the treatment of back pain. Authors’ addresses: Valley Central High School, Montgomery, NY 12549 (Sullivan); The Animal Population Health Institute, Department of Clinical Sciences, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins, CO 80523 (Hill); and Gail Holmes Equine Orthopaedic Research Center, Department of Clinical Sciences, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins, CO 80523 (Haussler); e-mail: Kevin.Haussler@Colostate.edu. © 2007 AAEP. *Presenting author.

1. Introduction
The most commonly prescribed treatments for chronic thoracolumbar pain in horses are stall rest, anti-inflammatories, and complementary therapies.1 Unfortunately, most treatments for back pain are anecdotal and unproven; they have never been evaluated in controlled, clinical trials for their effectiveness in reducing pain or musculoskeletal dysfunction.2 Pressure algometry has been used to objectively measure mechanical nociceptive thresholds (MNTs) within the axial skeleton3 and to quantify both bony and soft tissue pain.4 The objectives of the study were to measure spinal MNTs, to evaluate the effects of chiropractic treatment, massage therapy, and phenylbutazone, and to compare the results with active and inactive control groups.

2. Methods
Thirty-eight healthy adult horses were used to determine baseline MNTs at seven bilateral sites within the epaxial musculature of the trunk region from the T3 to S2 vertebral levels. A pressure algometera with a 1-cm² rubber plunger tip and a calibrated range from 0 to 30 kg/cm² was used to determine MNTs using previously described techniques.3 Higher MNTs corresponded to reduced pain perception or higher pain thresholds. The horses were assigned to three treatment groups: instrument-assisted chiropractic treatment, therapeutic massage, and phenylbutazone. On day 0, the chiropractic group received high-velocity, low-amplitude thrusts provided by a spring-loaded, mechanical-force instrument.b The hand-held instrument produces a very short duration (<5 μs) impulsive-type force.5 Treatment was applied bilaterally to bony prominences of the cervical, thoracolumbar, and sacral vertebrae at localized regions of joint stiffness, muscle hypertonicity, or pain. On day 0, the therapeutic massage group had a single treatment session at areas of muscle hyper-
tonicity or pain within the bilateral epaxial musculature of the cervical, thoracolumbar, and sacral regions. A certified massage therapist administered the treatment. The phenylbutazone group was medicated (1 g/500 lb, q 12 h, orally) for 7 days. Our hypothesis was that low-grade or subclinical pain and inflammation was present in the ridden horses because of the physical process of being ridden regularly. It was anticipated that non-steroidal anti-inflammatory drug (NSAID) administration would increase the MNTs from baseline values. Two control groups consisted of either maintained, ridden exercise without any additional treatment (i.e., active control) or routine paddock turnout with no ridden exercise (i.e., inactive control). MNTs were repeated at 1, 3, and 7 days post-treatment. The MNT values were pooled across sites within each horse to establish overall median values. The percentage change from baseline MNT values was calculated within each group.

3. Results
On day 1, the overall median MNT increased 8% from baseline in the massage-therapy group and decreased 1% in the chiropractic group. The phenylbutazone group had the largest decrease in overall MNTs at 9%. On day 3, the chiropractic and massage-therapy groups had an 11% and 9% increase in MNT values, respectively. The phenylbutazone group continued to have a decreased MNT value of 6%. On day 7, the overall MNT increased 27% in the chiropractic, 12% in the massage-therapy, and 8% in the phenylbutazone groups. MNT changes of less than ±1% were measured within the active and inactive control groups across all days.

4. Discussion
A single application of chiropractic treatment and massage therapy were both effective at increasing spinal MNTs within asymptomatic horses over the course of 1 wk. Pressure algometry provides an objective tool to evaluate commonly used but unproven treatment modalities for the treatment of back pain. Future studies need to evaluate combined treatment effects and long-term MNT changes in horses with documented back pain.

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References and Footnotes

aModel FPK 60, Wagner Instruments Inc., Greenwich, CT 06836.