Assessment of Intravenous or Intra-articular Hyaluronic Acid, Chondroitin Sulfate, and N-acetyl-D-glucosamine in Treatment of Osteoarthritis Using an Equine Experimental Model

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Significant improvement in lameness and disease progression was observed with intra-articular (IA) HACSAG. Authors’ address: Gail Holmes Equine Orthopaedic Research Center, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins, Colorado 80523; e-mail: david.frisbie@colostate.edu (Frisbie). © 2009 AAEP.

1. Introduction
Hyaluronic acid, chondroitin sulfate and N-acetyl-D-glucosamine (HACSAG) has been formulated into a new product, Polyglycan®. Safe and effective clinical usage has been anecdotally reported to the manufacturer in horses intra-articularly (IA) and intravenously (IV) for 3 years.

2. Materials and Methods
Osteoarthritis (OA) was induced in one middle carpal joint (MCJ) of 24 horses (n = 8/treatment group). All MCJs were treated with 125 mg of amikacin. Placebo (PCB) and IV HACSAG horses also received 5 ml of sterile saline in both MCJs, whereas IA HACSAG treated horses received 5 ml of HACSAG in the OA-affected joint on days 0, 7, 14, and 28. IV HACSAG treated horses received 5 ml of HACSAG intravenously every fifth day throughout the study. Evaluations (0–4 scale) included clinical, radiographic, gross, and histologic examinations as well as synovial fluid, histochemical, and biochemical analyses. Data were analyzed using a mixed model analysis of variance (p < 0.05 was significant).

3. Results
No adverse treatment-related events were detected. IA HACSAG significantly improved lameness as well as radiographic and bone proliferation scores compared with PCB-treated OA-affected joints. Full-thickness cartilage erosion was also significantly improved in both IA HACSAG and IV HACSAG treatment groups. Response to flexion and radiographic interpretation differed when the IV HACSAG was compared with the IA HACSAG or PCB OA-affected limbs; this finding is under further investigation.

4. Discussion
IA HACSAG showed symptom- and disease-modifying effects when administered at the time of disease induction.

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Footnotes
aPolyglycan, manufactured for Arthrodynamic Technologies, LLC, Versailles, KY 40383. Polyglycan® is marketed as a veterinary medical device for post-surgical lavage. It is not marketed or approved for use as a drug.
bAmikacin, Sico Pharmaceuticals Inc., Irvine, CA 92606.