Evaluation of Autologous Protein Solution Injection for Treatment of Tendonitis in an Equine Model

Angela M. Gaesser, DVM, DACVS*; Claire Underwood, VetMB, MA, PhD; Renata L. Linardi, DVM, PhD; Kayla M. Even, BSc; Virginia B. Reef, DVM, DACVIM, DACVSMR; Snehal Shetya, PhD; Robert L. Mauck, PhD; William J. King, PhD; Julie B. Engiles, VMD, DACVP; and Kyla F. Ortved, DVM, PhD, DACVS, DACVSMR

Intralesional injection of autologous protein solution (APS) may result in superior and faster healing of tendonitis. Authors’ addresses: Department of Clinical Studies, New Bolton Center, School of Veterinary Medicine, University of Pennsylvania, Kennett Square, PA 19348 (Gaesser, Underwood, Linardi, Even, Reef, Ortved, Engiles); Department of Pathobiology, New Bolton Center, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, PA 19104 (Engiles). McKay Orthopaedic Research Laboratory, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA 19104 (Shetya, Mauck). Owl Manor Veterinary, Inc., 720 E Winona Avenue, Warsaw, IN 46580 (King); e-mail: agaesser@vet.upenn.edu. *Corresponding and presenting author. © 2021 AAEP.

1. Introduction
The use of autologous protein solution (APS) in tendon and ligament injuries hasn’t been studied in vivo in the horse. The objective of this study was to evaluate the effect of APS on tendon healing in an equine superficial digital flexor (SDF) tendonitis model. The authors hypothesized that intralesional injection of APS would result in superior structural and biomechanical healing.

2. Materials and Methods
SDF tendonitis was induced in both forelimbs of eight horses using collagenase injection. One forelimb received an intralesional injection of APS, while the other was injected with saline. Ultrasonographic examinations were performed at 2 week intervals following treatment. At 12 weeks, horses were euthanized and SDF samples harvested. Histologic evaluation, biomechanical testing, gene expression analysis and total glycosaminoglycan (GAG), and total DNA quantification were performed.
3. Results

Collagen type III (COL3A1) expression was significantly higher (p = 0.028) in saline-treated tendon than in normal tendon. Mean total DNA content was significantly higher (p = 0.024) in saline-treated tendons than normal tendons, whereas total DNA content was not significantly different between APS treated tendon and normal tendon. No other statistically significant results were reported.

4. Discussion

Reduced expression of COL3A1 in APS-treated tendon may indicate superior healing. Increased total DNA content in saline-treated tendons may indicate ongoing healing processes, versus APS-treated tendons which may be in the later stages of healing. Limitations include a short study period and inconsistency in size and severity of induced lesions.

Acknowledgments

Declaration of Ethics

The Authors have adhered to the Principles of Veterinary Medical Ethics of the AVMA.

Conflict of Interest

This study was funded by Owl Manor, the manufacturer or Pro-Stride® APS. William J. King is the Director of Research and Development at Owl Manor. The remainder of the authors have no conflicts of interest.