

# Evaluation of Extracorporeal Shock Wave (ESWT) Therapy in Experimental Induced Equine Osteoarthritis

## Authors:

C. W. McIlwraith, D.D. Frisbie, C.E. Kawcak

## Institution:

Equine Orthopaedic Research Center  
Colorado State University, 2503 Bay Farm Road  
Ft. Collins, CO 80523

There is some experimental evidence and anecdotal clinical impression of extracorporeal Shock Wave Therapy (ESWT) for the treatment of osteoarthritis (OA).<sup>1, 2, 3</sup> The study was a blinded, experimentally controlled, randomized block design that used 24 horses in an established model of OA.<sup>4</sup> On day 0 of the study, arthroscopic surgery was performed on both middle carpal joints of horses and OA induced in one middle carpal joint. On day 14, horses were divided into three treatment groups, sham control, positive control (intramuscular PSGAG), and ESWT treated. The sham control group was treated similarly to the ESWT treated group in all respects except that bubble wrap was applied to the probe end to absorb all of the energy. The ESWT group received treatment on days 14 and 28 using a VersaTron® 12 mm probe. 2000 Shock Wave level were given on day 14 and 1500 Shock Waves on E6 level on day 28. Energy was delivered mainly to the middle carpal joint capsule attachment, but some delivered to the area of fragmentation. At day 14, horses began a strenuous treadmill exercise program.

Significant improvement in clinical lameness was noted at the first evaluation time point post-treatment (14 days) in the ESWT-treated horses compared with both the sham and positive control. The subsequent improvement was also noted at days 42, 56, and 70. Both the positive control and the ESWT horses had significant improvement in synovial fluid TP levels within 14 days of treatment, indicating less synovitis compared with sham control horses. Improvement with both Adequan® and ESWT treatment was also noted in the amount of glycosaminoglycan (GAG) released into the bloodstream 14 days post-treatment.

In conclusion, treatment with ESWT reduced the clinical signs of pain measured by lameness evaluations (this pain was even reduced 42 days after the last treatment, which was the longest time point measured). There was no significant improvement in response to flexion, implying that improvement in lameness was not caused by local desensitization of the region, or more specifically the joint capsule. Currently synovial fluid protein, another parameter of synovitis, was reduced with ESWT. There was no difference in articular cartilage parameters suggesting that ESWT had a greater effect on the soft tissue surrounding the joints compared with the articular cartilage.

## References and Footnotes

1. Coombs R, Schaden W, Zhou SSH. Musculoskeletal shockwave therapy. London: Greenwich Medical Media, 2000.
  2. Scheuch B, Whitcomb MB, Galuppo L, et al. Clinical evaluation of high-energy extracorporeal shock waves on equine orthopedic injuries, in Proceedings. 19th Annual Meeting of the Am. Assoc. Equine Sports Med. 2000; 18-20.
  3. Carroll GD, Hague B, Smitherman S, et al. The use of extracorporeal shock wave lithotripsy for treatment of distal tarsal arthropathies of the horse, in Proceedings. 18th Annual Meeting of the Am. Assoc. Equine Sports Med. 1999; 40-41.
  4. Frisbie DD, Kawcak CE, Trotter GW, et al. The effects of triamcinolone acetate on an in vivo equine osteochondral fragment exercise model. Equine Vet J 1997; 29: 349-359.
- Presenting Authors Email: wayne.mcilwraith@colostate.edu