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**Preliminary results of extracorporeal shock wave therapy as a non-invasive treatment of degenerative musculoskeletal disorders in 7 dogs**

Introduction

Extracorporeal Shock Wave Therapy (ESWT) is often successfully used in human and equines with degenerative musculoskeletal diseases. The effect of Extracorporeal Shock Wave Therapy as a treatment modality for degenerative musculoskeletal disorders in dogs was analysed by force plate analysis.

Material and Methods

Seven dogs of different breeds (one German Shepherd, one Husky and five mixed breeds) have been included in this study. Three were females and four males. Age ranged from 5 to 11 years, bodyweight from 27.7 to 41 kilograms. Diagnoses of musculoskeletal disorders were made by orthopedic examination and confirmed with radiographs and ultrasound in all dogs. Four patients had slight to severe coxarthrosis (three patients had bilateral osteoarthritis, one patient had an unilateral osteoarthritis); one animal had a moderate to severe bilateral cubarthrosis, one had a severe bilateral gonarthrosis and one dog had a tendinopathy of the infraspinatus and supraspinatus tendon of the right shoulder. In dogs with bilateral degenerative joint disease, only the clinically worse side was selected to undergo shockwave therapy. ESWT were performed without sedation or anesthesia. Before ESWT, ground reaction forces were measured, using a treadmill system with four force plates. Velocity of treadmill was between 1.06 and 1.22 m/s. Peak maximal force (*Fz*), mean vertical force (*Fm*) and impulse (*I*) were evaluated. All values were normalized with respect to the dog's bodyweight and expressed in percent of bodyweight. Kinetics were evaluated before each ESWT and one month after the 3<sup>rd</sup> treatment. ESWT has been performed using the Swiss DolorClast Vet system (EMS Electro Medical Systems, Nyon, Switzerland). All animals received three treatments in a weekly interval. In each session, between 1000 and 2000 impulses at a frequency of 15 Hertz and a pressure of 2.0 bars were administered to the tissue over the targeted area. Descriptive statistics was used to evaluate inter-treatment differences and to compare the treated and the non-treated limb.

Results

Orthopedic examination of the clinically worse limb revealed slight to moderate lameness, decreased range of motion and obvious pain upon manipulating the diseased joints in all 7 dogs. In the first kinetic analysis prior to ESWT, all 7 dogs showed decreased *Fz*, *Fm* and *I* in the clinically worse limb compared to the contralateral limb. The calculated differences between the treated and the non-treated limb ranged from 1.86 to 7.74 % bodyweight for *Fz*, from 1.27 to 5.32 for *Fm* and from 1.27 to 5.78 for *I*.

After first ESWT kinetic data were markedly improved in all dogs with coxarthrosis. One week after second ESWT all dogs showed a deterioration in ground reaction forces, however in two dogs values were better than before the first treatment. Thirty days after last ESWT three dogs showed markedly improvement in ground reaction forces compared to before treatment, in the remaining dog data suggested no improvement.

The one patient with the cubarthrosis and the one with gonarthrosis also showed markedly improvement after the 1<sup>st</sup> ESWT. This improvement was still obvious at the end of this study. The dog with the tendinopathy showed a measurable deterioration after the 1<sup>st</sup> ESWT in *Fm* and *I*. After 2<sup>nd</sup> treatment as well as 1 month after the 3<sup>rd</sup> ESWT, kinetic data improved, and the animal did not show any further clinically lameness and pain.

Three animals had minor skin irritations and/or petechial bleeding. All of these side effects disappeared within 24 hours.

Discussion / Conclusion

ESWT was well tolerated in all 7 dogs without sedation or general anesthesia. Six out of seven animals improved during the course of this study. Only minor complications have been seen, however animals with a bleeding disorder should not be treated with ESWT. This new treatment modality might be helpful in patients with musculoskeletal disorders, however studies with more homogenous groups, larger patient numbers and long-term follow-ups are needed to establish shockwave therapy as an effective treatment in dogs.