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Efficacy of a commercial dry sleeve cryotherapy system for cooling the equine metacarpus

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Abstract

Objective: To determine the ability of a commercial cryotherapy system (Game Ready Equine) to cool the metacarpal subcutaneous tissue and the superficial digital flexor tendon (SDFT) in horses.

Study design: Experimental study.

Animals or sample population: Six healthy adult horses.

Methods: Thermocouples were implanted into the metacarpal subcutaneous tissues and the SDFT of six horses. Two treatments (cryotherapy or cryotherapy with 5-50 mmHg intermittent compression) were randomly assigned to forelimbs and performed for 20 minutes. Temperatures were compared to the target range of 10-19°C and between groups.

Results: Only one limb in the cryotherapy/compression group reached the target range after cryotherapy. Temperatures did not differ between treatment groups at time 0. Lowest temperatures achieved in the subcutaneous tissue (p = .0043) and SDFT (p = .005) were 4.9 and 7.6°C lower when intermittent compression was applied. Similarly, applying compression induced a maximum change in temperature of approximately 7.0°C in the subcutaneous tissue (p = .014) and 10.2°C in the SDFT (p = .0001).

Conclusion: The cryotherapy system did not cool equine subcutaneous tissue or SDFT to the target temperature range, except in one limb. Combining cryotherapy with intermittent compression did result in lower temperatures and a greater change in temperature of the subcutaneous tissue and SDFT.

Clinical significance: When using this cryotherapy system, the addition of intermittent compression should be considered to achieve lower temperatures and potentially greater reduction in inflammation. Further studies are warranted to determine the effect of longer treatment times, higher compression settings, and the optimal temperature for benefits in normal and diseased equine tissues.

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