Dynamic Chiropractic

SPORTS / EXERCISE / FITNESS

Sports Update

We often ask ourselves questions about therapies we use because our experience seems contradictory to what we have been taught. Other times, we hear through patients or colleagues about new approaches to management and would like to consider the use or recommendation of these therapies because they appear to be a good alternative to surgical management.

Finding the answers to these questions and concerns often lies in the literature, but who has the time to search through the vast amounts of literature pouring out exponentially on a daily basis? The answer is to develop a weekly strategy of sitting down at your computer and taking an hour to search the many free databases available.

Additionally, many periodicals like the American Journal of Sports Medicine have a web page that allows searches and gives tables of contents or full text versions of old articles. Many publications, including Dynamic Chiropractic, offer summary reviews for periodicals, such as the one in DC for the Journal of Manipulative and Physiological Therapeutics. (*Editor's note:* DC in conjunction with NCMIC also offers each month the Chiropractic Research Review.) Other periodicals that carry similar features are the ACA Journal, Chiropractic Sports Medicine and Rehabilitation, and the Journal of Occupational and Sports Physical Therapy, to name a few. I attempt from time to time to pull out a few articles that have answered my questions with the assumption that you too may have had similar concerns. Following are some recent examples.

Zemke JE, Anderson JC, Guion WK, et al. Intramuscular temperature responses in the human leg to two forms of cryotherapy: ice massage and ice bag. JOSPT 1998;27(4):301-307.

This study attempted to determine which form of cryotherapy cooled deeper tissues fastest and if there was a continuing cooling effect after the cryotherapy was removed. A 23-gauge hypodermic needle microprobe was inserted into the subjects' medial gastrocnemius muscle. Cryotherapy was applied for 15 minutes and then removed. Temperature readings were taken every 30 seconds and continued to be taken for 30 minutes after removal of the cryotherapy.

The results indicated that cooling to occur after cryotherapy was removed. In fact, the lowest temperature occurred when the cryotherapy was not in place. Ice massage (applied in overlapping horizontal strokes) achieved its lowest reading in about 18 minutes, while ice bag application achieved its lowest reading in 28 minutes. The authors suggest that in acute injury to muscle or tendon, ice massage should be the treatment of choice. Again, the application was for 15 minutes with overlapping horizontal strokes.

Bandy WD, Irion JM, Briggler M. The effect of static stretch and dynamic range-of-motion training on the flexibility of hamstring muscles. JOSPT 1998;27(4):295-300.

I had heard from colleagues that a safer and possible more effective way to stretch muscles was to have the patient perform a slow, full movement. The patient begins in neutral and takes about 4-5 seconds to move through the antagonistic pattern. The patient holds the end-range position for 4-5 seconds and then slowly over 4-5 seconds moves back eccentrically to the neutral starting position. For stretching the hamstrings, the movement would be knee extension. The researchers compared this dynamic range-of- motion (DROM) approach to a 30-second static stretch held at end-range. The results indicated that both were effective, however, the 30-second static stretch increased ROM of the hamstrings more than two times that of DROM stretching.

Best TM, Loitz-Ramage B, Corr DT, Vanderby R. Hyperbaric oxygen in the treatment of acute muscle stretch injuries: results in an animal model. Am J Sports Med 1998;26(3):367-372.

A new "fad" is the treatment of muscle/tendon injuries with hyperbaric oxygen (HBO). Most people are acquainted with the use of HBO for decompression sickness, air embolism and carbon monoxide poisoning. It has also been used in the treatment of severe burns and crush injuries.

More recently, researchers and sports specialists have experimented with the use of HBO with compartment syndromes and osteomyelitis with varying degrees of success. Because some preliminary studies indicate some benefit from treating muscle-tendon and ligament injury, HBO facilities have blossomed. There are now over 260 hyperbaric facilities in the USA, and an additional 350 "single occupant" units.

A single 90-minute treatment costs $300-$400 in the U.S. Hyperbaric oxygenation is the delivery of 100% oxygen at two to three times the atmospheric pressure at sea level. The belief is that HBO enhances oxygen delivery and speeds up recovery of damaged ischemic tissue. Although there is little literature to support this belief in relation to soft tissue, this current study attempted to study the effects in animals. Other studies indicated that there was a 70% improvement in expected recovery time, or a 30% quicker return to competition after ankle sprain.

This current study examined histologically and functionally stretch injury to the tibialis anterior muscle in rabbits. It appeared that there was more complete healing after seven days post-injury and that the rabbits treated with HBO had far less ankle isometric torque deficit compared to the control group. These results are encouraging, yet human studies still need to be performed to allow more broad statements to be made regarding the advantages of HBO over standard care.

Alfredson H, Pietila T, Jonsson P, Lorentzon R. Heavy load eccentric calf muscle training for the treatment of chronic Achilles tendinosis. Am J Sports Med 1998;26(3):360-366.

Having had a problem with a chronic Achilles tendinosis, I was curious as to the effects of eccentric training. This study compared eccentric training over a 12-week period. The control group (15 recreational athletes) that performed standard approaches such as NSAIDs, rest, modification of activity, change in shoes, etc. all went on to surgery. None of the recreational athletes that used the eccentric method needed surgery; in fact, all 15 patients went back to pre-injury levels of running activity!

The eccentric training was performed two times a day, seven days a week for 12 weeks. The

training consisted of three sets of 15 repetitions. Initially, the athletes loaded the ankle off of an edge with body weight, performed with the knee straight, and also with it bent. The athlete lifted into a plantarflexed starting position by using the well ankle first (no concentric activity of the injured side). They then lowered off the edge slowly through an eccentric contraction of the triceps surae group (slow dorsiflexion imposed by gravity and body weight). Return to the start position was accomplished, again, by the well ankle without any concentric activity of the involved ankle.

The athletes advanced through stages using a backpack with weight or weight equipment. This study is encouraging, and I would think would stimulate other studies with regard to common chronic tendon problems in the ankle/foot, knee, forearm and shoulder.

Thomas Souza, DC, DACBSP
San Jose, California
Arrwes-aol.com

JULY 1998