



SPORTS MEDICINE LITERATURE

Sports Med. 2005;35(9):739-46.

Hyperbaric oxygen as an adjuvant for athletes.

Ishii Y, Deie M, Adachi N, Yasunaga Y, Sharman P, Miyanaga Y, Ochi M.

There has recently been a resurgence in interest in hyperbaric oxygen (HBO) treatment in sports therapy, especially in Japan. Oxygen naturally plays a crucial role in recovery from injury and physiological fatigue. By performing HBO treatment, more oxygen is dissolved in the plasma of the pulmonary vein via the alveolar, increasing the oxygen reaching the peripheral tissues. HBO treatment is therefore expected to improve recovery from injury and fatigue. HBO treatment has been reported to reduce post-injury swelling in animals, and in humans; swelling was also mitigated, but to a lesser extent. Positive results have also been reported regarding tissue remodelling after injury, with injuries involving bones, muscles and ligaments showing improved recovery. Furthermore, HBO treatment has effectively increased recovery from fatigue. This was clearly seen at the Nagano Winter Olympics, where sports players experiencing fatigue were successfully treated, enabling the players to continue performing in the games. Despite its potential, HBO treatment does have its risks. Increasing oxygen levels in tissues poses a risk to DNA through oxidative damage, which can lead to pathological changes in the CNS and the lungs. Regarding the operating of HBO systems, safer administration should be advised. Further research into HBO treatment is required if this therapy is to become more widespread. It should become possible to tailor treatment to an individual's condition in order to use HBO treatment efficiently.

J Am Podiatr Med Assoc. 2003 Jul-Aug;93(4):298-306.

Hyperbaric oxygen therapy for lower-extremity soft-tissue sports injuries.

Kanhai A, Losito JM.

Lower-extremity injuries have become increasingly common as sports performance demands have risen. Hyperbaric oxygen therapy is one method used to return athletes to competition as quickly as possible, but it has received criticism and lacks support. This review examines the literature on hyperbaric oxygen therapy and soft-tissue sports injuries. In the various studies, the location of the injury seemed to influence the effectiveness of treatment. Injuries at areas of reduced perfusion such as muscle-tendon junctions and ligaments seemed to benefit more from hyperbaric oxygen treatment than injuries at the muscle belly. Differences in the magnitude of the injury and in the time between injury and treatment may also affect outcomes. The authors sought to explore these variables as they relate to soft-tissue sports injuries and to weigh the benefits of hyperbaric oxygen therapy against its potential risks and high cost. More randomized controlled clinical trials with larger sample sizes must be conducted before hyperbaric oxygen can be established as a safe adjunctive therapy for soft-tissue sports injuries.



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Sports Med. 2000 Dec;30(6):395-403.

The role of hyperbaric oxygen therapy in sports medicine. - Babul S, Rhodes EC.

During the past decade, we have seen a growing number of individuals participating in sport and recreational activities. All indications show an increase in sport participation at every age level. However, the number of sport and recreational injuries as a result of this increase has also risen. Unfortunately, a primary cost related to injury recovery is the time lost from participating in and resuming normal functional activity. This has compelled health care professionals to seek more efficient and effective therapeutic interventions in treating such injuries. Hyperbaric oxygen (HBO) therapy may serve to provide a means of therapy to facilitate a speedier resumption to pre-injury activity levels as well as improve the short and long term prognosis of the injury. Although a growing interest in sports medicine is becoming evident in the literature, the use of HBO as an intervention in this field has received a great deal of cynicism. To date, numerous professional athletic teams, including hockey (NHL), football (NFL), basketball (NBA) and soccer (MLS), utilise and rely on the use of HBO as adjuvant therapy for numerous sports-related injuries acquired from playing competitive sports. However, to date, very little has been published on the application benefits of hyperbaric therapy and sports injuries. The majority of clinical studies examining the efficacy of HBO in treating soft tissue injuries have been limited in their sample size and study design. Further research needs to be conducted suggesting and validating the significant effects of this treatment modality and further grounding its importance in sports medicine.

Am J Sports Med. 1999 Sep-Oct;27(5):600-5.

Effects of hyperbaric oxygen on a human model of injury.

Staples JR, Clement DB, Taunton JE, McKenzie DC.

To determine whether intermittent exposures to hyperbaric oxygen enhance recovery from delayed-onset muscle soreness of the quadriceps, we conducted a randomized, controlled, double-blinded, prospective study using 66 untrained men between the ages of 18 and 35 years. After the induction of muscle soreness, these subjects were treated in a hyperbaric chamber over a 5-day period in two phases, with four groups (control, hyperbaric oxygen treatment, delayed treatment, and sham treatment) in the first phase; and three groups (3 days of treatment, 5 days of treatment, and sham treatment) in the second phase. The hyperbaric exposures involved 100% oxygen for 1 hour per day at 2.0 atm. The sham treatments involved 21% oxygen for 1 hour per day at 1.2 atm. We monitored recovery using a leg dynamometer to test eccentric torque of the nondominant quadriceps muscle before and immediately after exercise and at 48 and 96 hours after exercise. Pain was tested daily using visual analog pain scales. In phase 1 a significant difference in recovery of eccentric torque was noted in the treatment group compared with the other groups. In phase 2, the recovery of eccentric torque for the 5-day treatment group was significantly greater than for the sham group from immediately after exercise to 96 hours after exercise. The pain data did not differ significantly in any comparison in either phase. The results suggest that treatment with hyperbaric oxygen may enhance recovery of eccentric torque of the quadriceps muscle from delayed-onset muscle soreness.