

Hyperbaric Oxygen Therapy in Sports Injuries !!!

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The news that decompression tanks usually used in the treatment of diving accidents, are used to enhance performance and speed the recovery of sport injuries, sparked a heated debate in the Sports Medicine fraternity. The sports man wants to recover as soon as possible and if people like Andre Joubert could recover from a fractured hand in record time during the 1995 Rugby World Cup- that's the way to go!

Let us look at the facts...

What is HBO?

Hyperbaric Oxygen therapy or HBO is the inhalation of 100% oxygen in a treatment chamber where the atmosphere is pressurised at more than 1 atmosphere absolute. Usually treatment in a chamber is administered at 2 atmospheres (equivalent of being 33 feet under sea water)- This increases the oxygen dissolved in your blood plasma and tissue fluids 10 fold, increases your blood oxygen content to 125% and the oxygen levels measured in your peripheral tissue (skin) to 300%.

What does that mean to the athlete?

It means that enough oxygen can get to the damaged tissue even if ordinary blood flow can no longer take it there e.g. in case of damaged blood vessels, acute swelling etc. The mechanism is not very clear but it is suggested that the high oxygen levels reduce the inflammatory response as well as limit oedema by acting as a free radical scavenger. It has been shown to enhance granulation tissue production, fibroblastic activity, collagen deposition and stimulate re-vascularisation.

For this reason HBO therapy is internationally recommended for the treatment of:

- Arterial Gas Embolism
- Carbon Monoxide toxicity
- Gangrene
- Crush injuries, acute traumatic infections
- Decompression Illness
- Reperfusion of ischaemic skin flaps and skin transplants
- Selected problem wounds
- Acute blood loss
- Osteomyelitis (Infection in bone)
- Radio necrosis
- Burn wounds
- Intra Cranial abscess (Brain abscess)

In South Africa medical aids will pay for the treatment of these conditions if it is administered by a qualified hyperbaric medical practitioner that belongs to UHMSA (Underwater Hyperbaric Medical Association of SA). If you need further information they can be contacted at: 012-344 2567. Currently there are great concerns about the misuse of treatment and over charging.

Is it effective in managing sport injuries?

The application of HBO in muscle-tendon and ligament injuries is controversial. There is very little clinical and scientific data to support its use in the treatment of sports injuries. Anecdotal evidence supports its use in performance enhancement and accelerated recovery after soft tissue injuries.

1. Fracture Healing:

Especially **complicated fractures of the facial bones** with high risk of infection have been proven to benefit from HBO. Faster healing, up to 2 weeks have been found.

2. Ankle inversion injury:

Temple University conducted a study to differentiate the recovery speed after ankle injury when treated with HBO or slightly compressed air but proved no real benefit.

3. Muscle injury recovery after eccentric exercise:

Seventy subjects were treated with HBO and normal oxygen (21%) for 5 days and it proved that HBO accelerated recovery of eccentric strength from DOMS (Delayed onset muscle soreness) but did not reduce the pain. It is postulated that free radical damage produced by neutrophils that cause ischaemia as well as reduced metabolism of cells at the injury site can be limited by HBO treatment.

4. Ligament Injuries:

A human study done on medial ligament injuries of the knees suggested positive effects on the outcome of pain and function of the injured side after 6 weeks but no real proof was found.

Treatment Regimes

Current regimes for acute injuries involves treating them early, once or twice a day for 5 to 7 days at 2 - 2.4 atmospheres. Chronic injuries are treated once a day for 10 to 15 days. These astronomical costs will come out of the athlete's own pocket.

How about safety??

Real risk occurs with treatments at 3 atmospheres and more of duration of longer than 60 minutes. Treatment breaks are taken to reduce this but at worst you can get oxygen-related seizures, Oxygen toxicity, Pneumothorax, Tension Pneumothorax. The most common mild complications are:

- Mild aural barotrauma
- Nausea
- Tooth and sinus pain
- Blurred vision

Patient are screened and excluded when they have:

- Upper respiratory tract infection
- Sinusitis
- Fever
- Confinement anxiety

HBO is an interesting and tantalising option for the injured sportsman but with little data available on the true mechanism, treatment regimes and therapeutic outcome, it is currently not recommended for the general treatment of injuries related to sport.

References:

1. American Orthopaedic Society for Sports medicine: American Journal of Sports med Vol.27: No2 -1999
2. Thomas M Best et al. Hyperbaric Oxygen in the treatment of Acute muscle stretch injuries. American Journal of Sports Med Vol. 26, No 3 - 1998
3. AOSSM Research: Hyperbaric Oxygen Therapy in Sport: American Journal of Sports Medicine, Vol 26, No4 - 1998
4. Charles N Borromio et al: Hyperbaric Oxygen therapy for acute ankle sprains. American Journal of Sports Med. Vol.25, No 5 -1997
5. PB James, B Scott, MW Allen: Hyperbaric Oxygen therapy in sports injuries
6. Staples, Clement: Hyperbaric Oxygen chambers and the treatment of sports injuries. Sports Med 1996 Oct 22 (4) 219-227.

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