Hyperbaric Medicine in South Africa

Frans Cronje

HBOT is not new to South Africa. Five of the leading national Government Hospitals acquired Vickers monoplace chambers over the period of 1960 to 1983. HBOT was primarily used as a radio-enhancer for external beam radiotherapy during this time, and most of the hyperbaric chambers were therefore installed in the respective radiotherapy departments. HBOT was also occasionally used in the treatment of gas gangrene and necrotizing infections, but when the indication for radiotherapy became obsolete, most of these units closed down. Only the unit in Bloemfontein is still providing regular HBOT to this day. There are also five Naval recompression facilities, situated in the major coastal cities around the country and these have all occasionally treated patients with HBO over the past ten years. However, none of them provide a regular HBO service and are primarily available for naval dive operations and for treating occasional civilian cases of decompression illness.

The recent revival in clinical hyperbaric oxygen therapy started in 1993 at the Institute for Aviation Medicine, a specialized unit in the South African Military Health Service (SAMHS). The small five-foot (1.5 meter) Draeger recompression chamber (formerly used to treat divers and aviators with decompression sickness) was employed by the author to treat a small number of patients with mandibular osteoradionecrosis, referred from Pretoria Academic Hospital. These few incidental treatments soon made way to what has become a full-time dedicated clinical HBO service, and the rapid growth required the installation of a larger chamber in 1996. This chamber (nicknamed "Miss Piggy" due to its apricot-peach color) increased the level of awareness of HBO, while the results obtained re-established recognition for the therapy. The author eventually resigned from the SAMHS in 1998 and opened the first private HBO facility at the Eugene Marais Hospital in Pretoria. Recently, three additional hospital-based, private, multiplace hyperbaric chambers have started up in South Africa, and one monoplace facility in Namibia. This development is once again making HBOT more readily available, and promoting its appropriate use in South Africa.

From 1983 to 1998, the UHMS indications were almost exclusively applied in South Africa, with the exception of isolated cases of multiple sclerosis in the early 1980s and some sports injuries and problems with non-union and septic non-union of bone. However, in 1998 a parent-group in Pietermaritzburg initiated the use of low-pressure HBOT for the treatment of cerebral palsy. A total of nine informal CP-treatment chambers opened between 1998 and 2000. This urged the Southern African Undersea and Hyperbaric Medical Association (SAUHMA), the official scientific and peer-review organization for diving and hyperbaric medicine in this country – affiliated to the UHMS – to formalize safety, training and reimbursement standards for South Africa as a matter of urgency. Three of the former CP treatment facilities have since evolved towards becoming mainstream HBO facilities, while several others have closed down.

In 1997 the author developed the Diving and Hyperbaric Medicine Staff Training course (DHMSTC) which has since been designated by the UHMS as a sponsored introductory course in hyperbaric medicine. A Clinical Hyperbaric Chamber Operator's Course (CHCOC) was subsequently developed and these two courses have been endorsed by SAUHMA as forming the minimum recommended training for the practice and application of HBOT. Through the efforts of SAUHMA, the DHMSTC, CHCOC, NFPA 99 Chapter 19 Safety Guidelines for Hyperbaric Facilities, as well as the UHMS documents on multiplace and monoplace chamber safety have been accepted and adopted in South Africa. Recently, Francois Burman, a South African mechanical engineer and technical advisor of SAUHMA published a Risk Assessment Guide for Recompression Facilities through the International Divers Alert Network. This reference is likely to become an international hyperbaric safety benchmark and forms the basis of the evolving South African Bureau of Standards' statutory safety and standards document on hyperbaric chambers.

Medicine in South Africa is divided into Government Health and fee-for-service or private medicine with its associated medical insurance structures, managed health care groups, and HMOs. Due to the demise of the original Vickers units, HBO is no longer readily available to Government Health patients. Interdepartmental financial transfers are required for the use of military facilities by Government Hospitals, and this has become prohibitive. In the private sector, HBOT is still largely restricted by a relatively small number of facilities. It is hoped that once more private facilities have been established, a mechanism can be created whereby Government Health patients can once again gain access to therapy without incurring high costs, directly or indirectly.

Until recently, there was no dedicated treatment code and tariff structure for hyperbaric therapy. Vaguely comparable codes had to be used to bill for HBOT and these have met with varying success. While the American Medical Association's CPT-9 code structure will probably eventually be introduced to this country, a unique code structure was urgently required in the interim. After three years, the South African Medical Association eventually accepted a dedicated set of physician treatment codes related to HBO and this year, after seven years, a technical tariff was approved. This is a very significant step forward and it is hoped that this structure will assist in ensuring effort-dependent and ethical application of HBOT in South Africa.

Hospital-based conventional hyperbaric medicine is

relatively expensive in South Africa and obtaining reimbursement will remain an ongoing challenge. Treatment costs range from $88 (in the military setting) to $130 (in the private sector) – including physician supervision. For this reason, Third Party payers approve the acute indications more easily, as these involve a smaller number of treatments. The chronic UHMS HBO indications often require significant motivation and are less readily approved. These include (in decreasing order of resistance) chronic refractory osteomyelitis, selected problem wounds (almost exclusively diabetic wound problems) and radionecrosis. Some medical aids have unfortunately made policy decisions against reimbursing for HBO and it has become an important objective for SAUHMA to reverse this by distributing scientific evidence for HBOT, cost-effectiveness, as well as creating mechanisms and safeguards to prevent abuse of the therapy. The goals of SAUHMA are very similar to the UHMS and at present, only the UHMS indications are endorsed.

While the road ahead is by no means easy, it is likely that private HBOT will become firmly established in South Africa over the next 5 years, and that its primary application will preferentially evolve towards the more acute UHMS indications.

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Letters to the Editor

Thoughts regarding air-integrated versus separate-second-stage octopus supplies

Dear Editor,

Acott has previously discussed problems with buoyancy compensators (BCDs).[1] In the recent review of regulator incidents by Goble and Acott they state 'The combination of a second stage regulator and a low-pressure BCD inflator as the 'spare' regulator is extremely difficult to use…'[2]

In an out-of-air (OOA) emergency, the air-integrated (Air2) alternative air source is definitely an inferior solution. If you are also wearing a dry suit, it becomes virtually unmanageable. An Air2 should never be fitted without a pull dump cable in the BCD deflator hose, to enable dumping the BCD without removing the Air2 from the mouth. However, this is a heavy task loading in a difficult circumstance, increasing the probability of an uncontrolled rapid ascent.

Another drawback of the Air2 configuration is the high probability that the unit is not serviced annually. Divers also tend to forget to cap the hose fitting, so water can enter the air barrel. If it is disconnected in sea water it must be thoroughly rinsed in fresh water to avoid corrosion.

On the other hand, proper gear maintenance and dive planning will make it extremely unlikely that you will need to share air, as first stages rarely fail catastrophically. An advantage of the Air2 is that it teaches donating the primary, which I believe is the proper method, since odds are the stricken diver will go for the primary in any case. Therefore, despite Acott's concerns, for no-decompression diving at recreational depths an Air2 is an acceptable compromise, provided students are taught properly how to use it and are warned of its limitations.

The most suitable open-water rig is a short-hose second stage hung from the neck with a bungee cord as a secondary or 'octopus' and a 2 m primary wound once around the neck. It is the primary that is donated in an OOA emergency and the donor takes the secondary. With this arrangement, there is plenty of hose for the recipient, reducing stress and allowing a controlled ascent, even from depth. This is the method favored by the GUE agency, and is an offshoot of the Hogarthian rig evolved for use in cave diving.

References

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2 Goble S, Acott C. Regulator incidents: 52 incidents from the Diving Incident Monitoring Study. *SPUMS J* 2003; 33: 30-34

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