Indications for Hyperbarics Oxygen Therapy

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Published: 10/06/2008 - 13:42

***AIR OR GAS EMBOLISM**

Air or gas embolism occurs when gas bubbles enter arteries, veins and/or capillaries. This results in reduced blood flow and poor oxygen delivery to the areas supplied by the affected circulation. If not fatal, gas embolism can result in severe, long-standing and irreversible physical and emotional disabilities.

***CARBON MONOXIDE POISONING**

Poisoning occurs by inhalation, either accidentally or intentionally (suicide attempt). CO binds to hemoglobin in red blood cells at the sites usually utilized to carry oxygen to tissues. Oxygen, and especially hyperbaric oxygen, accelerates the clearance of CO from the body, thereby restoring oxygen delivery to sensitive tissues such as brain and heart

***CLOSTRIDIAL MYOSITIS & MYONECROSIS (GAS GANGRENE)**

Clostridial myositis and myonecrosis is an acute, rapidly progressive infection of the soft tissues commonly known as “gas gangrene.” The infection is caused by one of several bacteria in the group known as “clostridium.” While over 150 species of clostridium have been identified, only a few commonly cause gas gangrene. The infection typically spreads from a discrete focus of clostridium within the body

***CRUSH INJURY, COMPARTMENT SYNDROME, and OTHER ACUTE TRAUMATIC ISCHEMIAS**

Crush injuries occur when body tissues are severely traumatized such as in motor vehicle accidents, falls, and gun shot wounds. These injuries frequently occur in the extremities. When crush injuries are severe, the rate of complications such as infection, non-healing of fractures, and amputations range up to 50%.

When used as an adjunct to orthopedic surgery and antibiotics, hyperbaric oxygen (HBO2) therapy shows promise as a way to decrease complications from severe crush injuries. HBO2 increases oxygen delivery to the injured tissues, reduces swelling and provides an improved environment for healing and fighting infection.

***DECOMPRESSION SICKNESS or ILLNESS and ARTERIAL GAS EMBOLISM**

When scuba diving, additional oxygen and nitrogen dissolve in body tissues. The additional oxygen is consumed by the tissues, but the excess nitrogen must be washed out by the blood during decompression. During or after ascent this excess nitrogen gas can form bubbles in the tissues, analogous to the carbon dioxide bubbles that form when a carbonated beverage container is opened. These bubbles may then cause symptoms that are referred to as decompression sickness (“DCS” or “the bends”)

***ENHANCEMENT OF HEALING IN SELECTED PROBLEM WOUNDS**

Problem wounds are those which fail to respond to established medical and surgical management. Such wounds usually develop in compromised hosts with multiple local and systemic factors contributing to inhibition of tissue repair. These include diabetic feet, compromised amputation sites,

nonhealing traumatic wounds, and vascular insufficiency ulcers (ulcers with poor circulation). All share the common problem of tissue hypoxia (low tissue oxygen level, usually related to impaired circulation).

*__EXCEPTIONAL BLOOD LOSS - ANEMIA__

For purpose of consideration of the use of hyperbaric oxygen (HBO2) therapy, exceptional blood-loss anemia is by definition loss of enough red blood cell mass to compromise sufficient oxygen delivery to tissue in patients who cannot be transfused for medical or religious reasons. Medical reasons may include the threat of blood product incompatibility or concern for transmissible disease. Religious beliefs may prohibit the receipt of transfused blood products.

*__INTRACRANIAL ABSCESS__

Abscess formation in the brain can be a devastating complication of sinus infections or bone infections (osteomyelitis) of the skull. Occasionally, abscesses are seeded from infection occurring in other parts of the body. Brain abscesses are frequently multiple.

*__NECROTIZING SOFT TISSUE INFECTIONS__

A number of types of infections of soft tissue may benefit from adjunct treatment with hyperbaric oxygen and are included in the category of “necrotizing soft tissue infections.” Names of such clinical syndromes include crepitant anaerobic cellulitis, progressive bacterial gangrene, necrotizing fasciitis, and nonclostridial myonecrosis. Gas gangrene (Clostridial myositis and myonecrosis) is a separate entity and is reviewed elsewhere in this site.

*__REFRACTORY OSTEOMYELITIS__

Osteomyelitis is an infection of the bone. Refractory osteomyelitis is a bone infection which has not responded to appropriate treatment. Hyperbaric oxygen increases the oxygen concentration in infected tissues, including bone. Hyperbaric oxygen directly kills or inhibits the growth of organisms which prefer low oxygen concentrations (strict anaerobes). These effects occur through the oxygen-induced production of toxic radicals or through an indirect effect medicated through the white blood cells (polymorphonuclear leukocytes).

*__HYPERBARIC OXYGEN TREATMENTS FOR COMPLICATIONS OF RADIATION THERAPY__

Cancer treatment has improved significantly over the past decade. Although cure of the cancer is still the highest priority of treatment, cancer specialists have come to recognize the ever-increasing importance of quality of life to the cancer survivor. One-half of the estimated 1.2 million new cases of invasive cancer will receive radiation therapy as a part of their cancer treatment. Side effects of this therapy can be very toxic, especially when combined with chemotherapy. Some people are more sensitive to radiation damage than others, and there are no reliable tests available as yet to identify those patients who will experience the worst side effects

*__SKIN GRAFTS AND FLAPS (COMPROMISED)__

Reconstructing complex wounds is accomplished by shifting or transferring tissues to the wound from a different part of the body. A “skin graft” is the transfer of a portion of the skin (without its blood supply) to a wound. A “flap” consists of one or more tissue components including skin, deeper tissues, muscle and bone. Flaps are transferred with either their own, original blood supply (pedicle flap) or with detached blood vessels which are attached at the site of the wound (free flap).

*__THERMAL BURNS__

Thermal burn injuries, if not fatal, can cause disastrous long-term physical and emotional disability for the survivor. Especially in closed space fires, thermal and smoke (products of combustion) damage to the lungs can occur, requiring in some cases intubation and use of a mechanical ventilator. Burn injuries characteristically progress to become deeper and more extensive with time.

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