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Hyperbaric oxygen therapy: implications for spinal cord injury patients with intrathecal baclofen infusion pumps. Case report

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A patient with a cervical spinal cord injury receiving intrathecal baclofen for spasticity control underwent a 7 week course of hyperbaric oxygen therapy to induce healing of an ischial decubitus ulcer. After completion of this treatment and during a routine baclofen infusion pump refill, the actual pump reservoir volume exceeded computer measurements obtained with telemetry. Examination of the physiology of hyperbaric oxygen therapy in relation to infusion pump function revealed that the intraspinal pressures attained during hyperbaric oxygen therapy produced retrograde leakage of cerebrospinal fluid into the infusion pump reservoir.

Keywords: hyperbaric oxygen therapy; intrathecal baclofen; muscle spasticity; spinal cord injury.

Introduction

Hyperbaric oxygen (HBO) therapy is an established technology that may be utilized as the primary treatment for certain medical conditions such as carbon monoxide poisoning or decompression sickness, or as an adjunctive measure to resolve certain recalcitrant wounds. SCI patients with decubitus ulcers may be eligible for HBO therapy if the etiology of the wound is reversible tissue hypoxia.[1] The continuous infusion of intrathecal baclofen via implantable infusion pumps has gained worldwide acceptance as an important new treatment modality for spasticity associated with SCI.[2,3] Several types of infusion pumps exist, although those utilizing microprocessor-based technology represent the most sophisticated devices. We present the first reported use of HBO therapy for a decubitus ulcer in an SCI patient receiving intrathecal baclofen therapy for spasticity control. This report highlights the physical changes associated with HBO therapy and their impact on infusion pump function.

Case report

A 22 year old male sustained a C4–5 fracture-dislocation during a motor vehicle accident resulting in C5 Frankel B quadriplegia. Following the SCI, the patient experienced severe spasticity which was refractory to oral medications, including baclofen, clonidine and dantrolene. Additionally, sedation and impairment of cognition were significant side effects interfering with the patient's scholastic and academic performance. Skin breakdown occurred frequently as a result of excessive skin trauma and difficulties with positioning. Subsequently, four years after the initial SCI, the patient underwent a successful temporary trial of intrathecal baclofen (Lioresal® Intrathecal, Medtronic, Inc) infusion followed by infusion pump implantation (Medtronic Synchromed® Model 8611H) for long term treatment. Initial dosage of baclofen was 150 mcg/day gradually increasing over the ensuing 8 months to 600 mcg/day to maintain