## Abstract

**Objectives.** The purpose of this Thesis is to Create a Critical Review that describes the methods, results, and conclusions of a literature review of the benefits and harms of hyperbaric oxygen therapy (HBOT) and the relation to the free radical production "Oxidative Stress", the usage of the (HBOT) for brain injury, cerebral stroke, and some neurological disorders.

**Selection Criteria.** We independently assessed each title and abstract using Predetermined inclusion criteria based on intervention, population, outcome measures, and study design criteria. Full papers, reports, and meeting abstracts that met inclusion criteria were retrieved and reviewed independently.

**Main Results.** Determine whether the benefits of HBOT outweigh the potential harms. For other types of brain injury, no good- or fair-quality studies were found. No controlled trial of HBOT was designed to measure mortality in stroke patients, and the best studies found some what improvement in neurological outcomes. Evidence about the type, frequency, and severity of adverse events in actual practice is inadequate. Reporting of adverse effects was limited, and no study was designed specifically to assess adverse effects. Evidence from well-conducted clinical studies is limited. The balance of benefits and harms of HBOT for brain injury, cerebral palsy, or stroke has not been adequately studied.

**Key words:** HBOT, HBO, Hyperbaric oxygenation, Free radicals, oxidative stress, Stroke, cerebral stroke, brain injury, stroke.