

## The efficacy of hyperbaric oxygen therapy in the management of chronic fatigue syndrome

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### ABSTRACT

**Objective:** Chronic fatigue syndrome (CFS) is a chronic disease with social components that ensue secondary to the incapacity of the person to fulfill work, social and family responsibilities. Currently, there is no consensus regarding its treatment. The aim of this study was to determine the efficacy of hyperbaric oxygen (HBO<sub>2</sub>) therapy in CFS.

**Design:** Sixteen patients included in the study were diagnosed with CFS according to the Fukuda criteria. Patients received 15 treatment sessions of HBO<sub>2</sub> therapy over a period of three consecutive weeks (five days per week). The outcome measures (visual analog fatigue scale (VAFS), Fatigue Severity Scale (FSS) and

Fatigue Quality of Life Score (FQLS) were assessed before the treatment and after completion of the 15 sessions.

**Results:** HBO<sub>2</sub> therapy was well tolerated, with no complications. After treatment, patients' scores were found to have improved with respect to VAFS, FSS and FQLS (all  $p < 0.005$ ).

**Conclusions:** We may infer that HBO<sub>2</sub> therapy decreases the severity of symptoms and increases the life quality of CFS patients. It may be a new treatment modality for the management of CFS. However, further studies with larger sample sizes and control groups are definitely awaited.

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### INTRODUCTION

Chronic fatigue syndrome (CFS) is a clinically defined condition characterized by severe disabling fatigue and a combination of symptoms that prominently features self-reported impairments in concentration, short-term memory, sleep disturbances and generalized musculo-skeletal pain for more than six months [1]. Its prevalence varies from 0.2% to 2.2% among adults, being twice as common in women as in men and affecting all social classes [2]. Diagnosis of CFS can be established only after other likely causes have been excluded.

Currently, there is no consensus regarding its treatment. Many patients try different therapies to overcome their fatigue, varying from pharmacological (e.g., immunoglobulin or corticosteroid therapy) to non-pharmacological treatments (e.g., massage and osteopathy) [3]. Because the conventional therapies are suboptimal, new

treatment modalities targeting different possible mechanisms of CFS pathogenesis are always drawing attention. Reactive oxygen species (ROS) and lactic acid – generated in active muscles – are suggested to have a critical role in the pathomechanism of fatigue [4-7]. Many mechanisms of action are possible given the susceptibility of proteins to oxidative damage, but current evidence points at the contractile proteins and the Na-K pump as the sites showing the greatest susceptibility to ROS under physiological conditions. Furthermore, the accumulation of lactic acid in muscle has historically been suggested to be the major cause of muscle fatigue [8].

In this regard, the strategies that aim to remove the ROS and lactic acid from the muscle cell seem to be reasonable for the treatment of CFS. One of them could be hyperbaric oxygen (HBO<sub>2</sub>) therapy. Previous studies have reported significant decrease in lactic acid