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Hyperbaric oxygen therapy improves neurocognitive functions of post-stroke patients – a retrospective analysis

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Abstract

Background: Previous studies have shown that hyperbaric oxygen therapy (HBOT) can improve the motor functions and memory of post-stroke patients in the chronic stage.

Objective: The aim of this study is to evaluate the effects of HBOT on overall cognitive functions of post-stroke patients in the chronic stage. The nature, type and location of the stroke were investigated as possible modifiers.

Methods: A retrospective analysis was conducted on patients who were treated with HBOT for chronic stroke (>3 months) between 2008-2018. Participants were treated in a multi-place hyperbaric chamber with the following protocols: 40 to 60 daily sessions, 5 days per week, each session included 90 min of 100% oxygen at 2 ATA with 5 min air brakes every 20 minutes. Clinically significant improvements (CSI) were defined as > 0.5 standard deviation (SD).

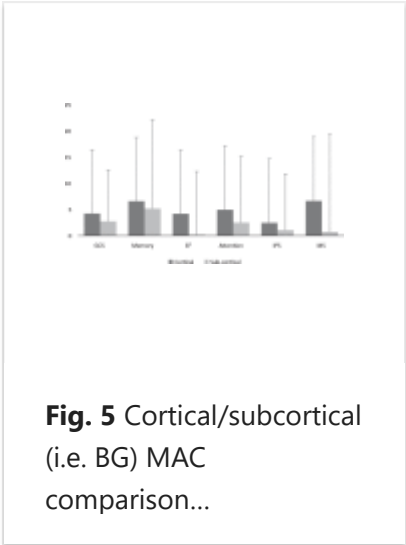
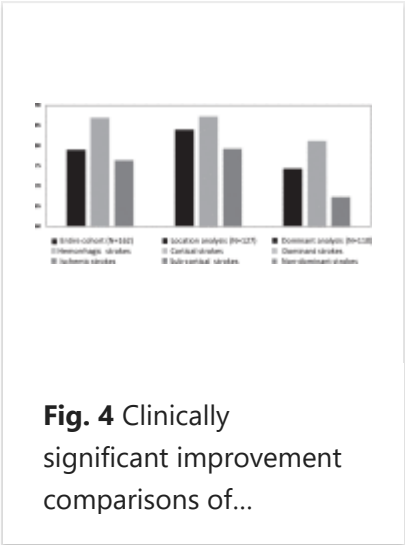
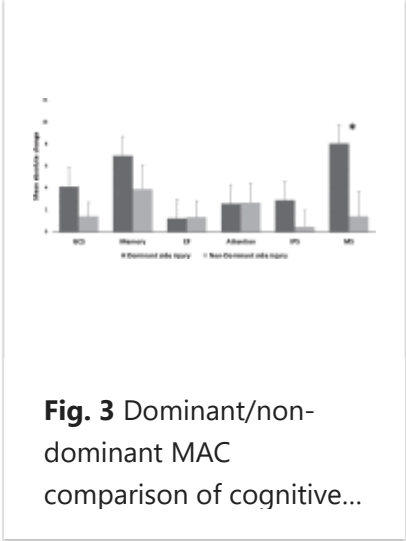
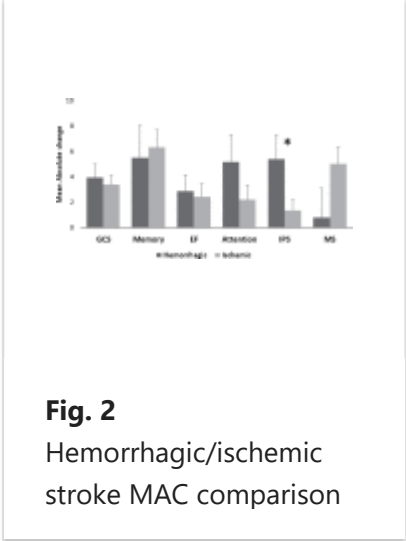
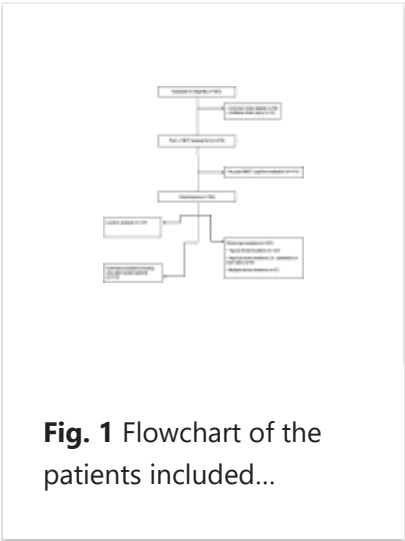
Results: The study included 162 patients (75.3% males) with a mean age of 60.75 ± 12.91 . Of them, 77(47.53%) had cortical strokes, 87(53.7%) strokes were located in the left hemisphere and 121 suffered ischemic strokes (74.6%).HBOT induced a significant increase in all the cognitive function domains ($p < 0.05$), with 86% of the stroke victims achieving CSI. There were no significant differences post-HBOT of cortical strokes compared to sub-cortical strokes ($p > 0.05$). Hemorrhagic strokes had a significantly higher improvement in information processing speed post-HBOT ($p < 0.05$). Left hemisphere strokes had a higher increase in the motor domain ($p < 0.05$). In all cognitive domains, the baseline cognitive function was a significant predictor of CSI ($p < 0.05$), while stroke type, location and side were not significant predictors.

Conclusions: HBOT induces significant improvements in all cognitive domains even in the late chronic stage. The selection of post-stroke patients for HBOT should be based on functional analysis and baseline cognitive scores rather than the stroke type, location or side of lesion.

Keywords: HBOT; cognitive function; hyperbaric oxygen; stroke.

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