

Hyperbaric oxygen therapy for post-stroke depression: A systematic review and meta-analysis

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Abstract

Objectives: Post-stroke depression (PSD) is common consequence of stroke. However, today the majority of PSD patients remains untreated or inadequately treated, especially in the developing countries. Herein, we performed a meta-analysis to evaluate efficacy and safety of hyperbaric oxygen (HBOT) therapy for PSD.

Patients and methods: Seven electronic databases were comprehensively searched for randomized clinical trials (RCTs) from inception to May 2019. Outcome measures included response rate, depression severity, neurological deficit, physical disability and adverse events.

Results: A total of 27 RCTs involving 2250 participants were identified. Patients in HBOT group had a higher response rate than patients in control group (response rate: 69.4% vs 51.2%, odds ratio [OR] = 2.51, 95% confidence interval [CI] [1.83-3.43], P = 0.000). HBOT significantly reduced Hamilton Depression (HAMD) -17 item scores (weighted mean difference [WMD] = -4.33, 95% CI [-4.82 to -3.84], P = 0.000), HAMD-24 item scores (WMD = -4.31, 95% CI [-5.01 to -3.62], P = 0.000), National Institute of Health Stroke Scale (NIHSS) scores (WMD = -2.77, 95% CI [-3.57 to -1.98], P = 0.000), Chinese Stroke Scale (CSS) scores (WMD = -3.75, 95% CI [-5.12 to -2.38], P = 0.000) and Modified Scandinavian Stroke Scale (MASSS) scores (WMD = -3.66, 95% CI [-6.26 to -1.06], P = 0.000). HBOT also improved Barthel Index (WMD = 10.68, 95% CI [7.98-13.37], P = 0.000). In subgroup analysis, Group A of studies with hemorrhage patients accounting for less than 20% achieved more reduction of HAMD 17-item score (WMD = -4.47, 95% CI [-5.17 to -3.77], P = 0.000) than Group B of studies with hemorrhage patients no less than 20% (WMD = -3.73, 95% CI [-4.20 to -3.26], P = 0.000). In addition,

patients with HBOT along with antidepressants treatment achieve superior results than patients with antidepressants monotherapy. Patients with HBOT monotherapy achieve a slightly higher response rate than patients with antidepressants monotherapy (OR = 1.29, 95% CI [1.04-1.60], P = 0.000). Besides, HBOT group reported less adverse events (9.6%vs16.6%, P < 0.05). The most frequent side-effect of HBOT is ear pain (26 cases).

Conclusion: Based on our pooled analysis, HBOT is effective and safe therapeutic approach for PSD. However, results should be cautiously interpreted due to a relatively poor methodological quality.

Keywords: Adverse events; Hyperbaric oxygen; Meta-analysis; Post stroke depression.

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