

# Oxygen therapy

Oxygen therapy, also known as supplemental oxygen, is the use of oxygen as a medical treatment. This can include for low blood oxygen, carbon monoxide toxicity, cluster headaches, and to maintain enough oxygen while inhaled anesthetics are given.

Nineteen patients with diffuse, blunt, non-severe TBI (mean age  $32.7 \pm 11.4$  years; 4 women and 15 men; Glasgow Coma Scale before transcranial alternating current stimulation (tACS)  $14.1 \pm 0.5$ ) were treated by 10 Hz in-phase tACS applied for 30 minutes to the left and right lateral prefrontal cortex at 21 days after TBI. Regional cerebral oxygen saturation (SctO2) in the frontal lobes was measured simultaneously by the cerebral oximeter. Significance was preset to  $P < 0.05$ . The SctO2 values before tACS were not different between hemispheres  $\sim 65\%$ . After 15 minutes of tACS, a significant ( $p < 0.05$ ) decrease in regional SctO2 was observed with the minimum at the eighth minute of  $53.4 \pm 3.2\%$  and  $53.4 \pm 3.2\%$  in the left and right hemispheres, respectively. At the end of the stimulation (30 minutes), the hemispheric differences in cerebral oxygen saturation became statistically insignificant again ( $p > 0.05$ ). Therefore, tACS causes a significant decrease in SctO2, probably, due to neuronal activation. This data indicate that tACS may need to be supplemented with oxygen therapy. Further research is required <sup>1)</sup>.

<sup>1)</sup>

Trofimov AO, Kopylov AA, Martynov DS, Zorkova AV, Trofimova K, Cheremuhin PN, Bragin DE. The Changes in Brain Oxygenation During Transcranial Alternating Current Stimulation as Consequences of Traumatic Brain Injury: A Near-Infrared Spectroscopy Study. Adv Exp Med Biol. 2021;1269:235-239. doi: 10.1007/978-3-030-48238-1\_37. PMID: 33966223.

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