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Transcranial Doppler Ultrasound in stable Chronic Obstructive Pulmonary Disease

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Introduction: Cognitive impairment is highly prevalent in patients with Chronic Obstructive Pulmonary Disease (COPD) and may be a potential obstacle to the effectiveness of respiratory therapy. Patients with dementia have a pronounced disturbance in their cerebrovascular hemodynamics, such as cerebral hypoperfusion and increased downstream vascular resistance, and patients with COPD who has cognitive impairment also showed an altered cerebral perfusion.

Objective: The present study aims to assess the presence of impaired cerebrovascular hemodynamic in stable COPD by means of transcranial doppler ultrasonography.

Methods: This observational study was conducted among patients with stable COPD without known neurologic diseases. We performed Transcranial Doppler (TCD) sonography through the temporal window using a 1–5 MHz phased array ultrasound transducer with a TCD preset. Cerebrovascular hemodynamics were assessed by measuring mean flow velocities in the middle cerebral arteries (related to cerebral perfusion), resistance index (related to vascular resistance) and pulsatility index (related to vascular resistance).

Results: Twelve consecutive patients (6 male; mean age, 61, 7 years) with stable COPD were assessed. The mean blood flow velocity in middle cerebral artery were decreased in 10 patients (mean flow velocity of 42,5 cm/s). The pulsatility index in middle cerebral artery were increased in 5 patients (mean pulsatility index of 1,03) and resistance index were normal in all patients (mean resistance index of 0,6).

Conclusions: This study showed decreased cerebral perfusion but normal values of indexes of cerebral vascular resistance in stable COPD patients.

References

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