

## Brain perfusion abnormalities in chronic obstructive pulmonary disease: comparison with cognitive impairment

Hulya ORTAPAMUK and Seniha NALDOKEN

*Department of Nuclear Medicine, Ankara Numune Research and Training Hospital, Ankara, Turkey*

**Objectives:** To clarify cerebral perfusion distribution and cognitive functions in patients with chronic obstructive pulmonary disease (COPD) according to the hypoxia levels and to assess if there is a relationship between cognitive impairment and cerebral perfusion index. **Patients and Methods:** Eight patients with stable hypoxemic COPD (HC), 10 patients with stable nonhypoxemic COPD (NHC), and 10 age-matched healthy volunteers participated in the study. All subjects underwent a complete neuropsychological assessment with the mental deterioration battery (MDB), Wechsler memory scale-revised (WMS-R), color trail test (CCT), and grooved pegboard test (GPT). SPECT examination with Tc-99m HMPAO was performed in all patients and controls. Quantitative analysis was performed by a region of interest (ROI)-based method. **Results:** The scores of verbal memory, delayed recall and attention were significantly lower in COPD patients ( $p < 0.01$ ). The scores of other subtests were similar in patients and controls. Comparing NHC patients to HC groups showed that verbal memory was impaired in both groups, but delayed recall and attention scores were significantly worse in HC patients than NHC patients. Perfusion indexes on frontal ROIs in NHC patients and frontal and parietal ROIs in HC patients showed significant decreases. Our scintigraphic findings were correlated with the results of neuropsychological tests. **Conclusions:** Our results demonstrate that cerebral perfusion is significantly altered in COPD patients. Hypoxemic patients showed more deterioration in cerebral perfusion and cognitive performance than nonhypoxemic patients. The relationship between decreased perfusion and cognitive impairment and the clinical significance of these results require further studies in larger populations.

**Key words:** chronic obstructive pulmonary disease, cognitive impairment, Tc-99m HMPAO SPECT