

Effect of CPAP on Cognition, Brain Function, and Structure Among Elderly Patients With OSA

A Randomized Pilot Study

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BACKGROUND: Despite the increasing aging population and the high prevalence of OSA in elderly adults, little is known about cognitive effects of OSA and the effectiveness of CPAP treatment. Therefore, this study investigated whether elderly patients with OSA present cognitive deficits and functional and structural alterations of the brain that could be improved by CPAP treatment.

METHODS: This randomized, evaluator-blinded, parallel-group, single-center pilot study involved patients aged ≥ 65 years with newly-diagnosed severe OSA syndrome. Thirty-three patients were assigned to receive either conservative care (CC) or CPAP plus CC for 3 months. At baseline and 3 months after treatment, patients underwent a neuropsychologic evaluation and a functional and structural MRI study of connectivity within the default mode network (DMN) and of cortical thickness.

RESULTS: Neuropsychologic evaluation revealed no differences in cognitive performance between OSA groups at baseline. By contrast, after CPAP treatment, patients showed a significant improvement in episodic (between-group difference in change, 7.60; 95% CI, 1.66-13.55; $P = .014$) and short-term memory (between-group difference in change, 1.06; 95% CI, 0.10-2.01; $P = .032$) and in executive function (speed of mental processing, 5.74; 95% CI, 1.69-9.79; $P = .007$; mental flexibility, -47.64 ; 95% CI, -81.83 to -13.45 ; $P = .008$), whereas no changes were observed in the CC group. Neuroimaging revealed an increase in the connectivity in the right middle frontal gyrus after 3 months of CPAP treatment and a higher percentage of cortical thinning in the CC group. No association was seen between cognition and brain functional connectivity changes within the DMN.

CONCLUSIONS: Elderly patients with severe OSA who present with cognitive difficulties could benefit from CPAP treatment. Moreover, CPAP treatment increases the connectivity of the DMN and attenuates cortical thinning.

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