COGNITIVE DYSFUNCTION AND AFFECTIVE DISORDERS IN OBSTRUCTIVE SLEEP APNEA: A CASE REPORT AND LITERATURE REVIEW

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Background and aims

- Obstructive sleep apnea syndrome (OSA) is a chronic condition characterized by episodes of upper airway obstruction during sleep that lead to sleep fragmentation and intermittent hypoxemia.
- Besides the well-known cardiovascular and metabolic disorders, OSA has also been associated with **cognitive impairment, depression, anxiety** and **other neuropsychological symptoms**. It is crucial to be aware of this association, since these comorbid symptoms may be misdiagnosed as a primary psychiatric condition.¹

OBJECTIVE: To report a case of cognitive dysfunction and affective disorder in a patient with OSA and provide a literature review on this topic.

MATERIAL AND METHODS: Review of patient clinical records and literature search for relevant articles on *PubMed*.

Results

CASE REPORT

60 year old man, who worked as an electrician for many years. He completed eleventh grade.

PAST MEDICAL HISTORY:

- Arterial Hypertension; Diabetes mellitus; Obesity; Dyslipidemia; Interstitial lung disease.
- He has a past history of depressive episode in 2009.

He was referred to our Psychiatry outpatient department for **depressive symptoms** with prominent **apathy, lack of initiation, slowed psychomotor function, daytime sleepiness** and **cognitive impairment** (Addenbrooke's Cognitive Examination-Revised – **81/100; Important deficits in memory and verbal fluency**). These symptoms were associated with great functional impairment.

Acute neurological disorder was excluded. Blood tests including full blood count, renal, liver and thyroid function tests, electrolytes, vitamin B12 and folate were within normal range. Brain Magnetic Resonance Imaging showed signs of ischemic leukoencephalopathy (probably related to arterial hypertension).

It was first assumed a depressive episode and the patient was treated with different antidepressants (sertraline, duloxetine, bupropion, fluoxetine) with poor response. Later, he was diagnosed with **severe OSA** (apnea-hypopnea index 52) and started treatment with continuous positive airway pressure (CPAP), with progressive improvement of depressive and cognitive symptoms. After some months, he stopped antidepressive therapy, with no recurrence of psychiatric symptoms.

COGNITIVE IMPAIRMENT AND OSA

- OSA is associated with cognitive dysfunction. Published studies have identified **attention, episodic memory, working memory and executive functions** as the most affected cognitive domains. Language ability or psychomotor function appear to remain unaffected.^{2,3}
- There is general agreement that not apnea recurrence in itself, but the associated **sleep fragmentation and nocturnal hypoxemia**, are the key factors affecting cognitive function in patients with OSA⁴

The severity of **SLEEP FRAGMENTATION** appears to be linked to deficits in attention/vigilance³

HYPOXEMIA appears to be linked to impairment in global cognitive functions³
- Effective CPAP treatment appears to improve global cognitive function. However, even the most optimally treated OSA patients may not experience a complete reversal in attention and executive function, probably due to a permanent brain alteration in severe cases.⁴

DEPRESSION AND OSA

- Symptoms like passivity and lack of initiation, loss of facial expression and slowed psychomotor function may be noticed in both OSAS (as a result of diurnal drowsiness) and depression, which make it difficult to distinguish between these two conditions. Nevertheless, several studies demonstrated **significantly higher rates of depression** (22-45%) and an **increased risk of developing depression** in OSA patients.^{5,6}
- The relation between both disorders is still not fully understood

Recent studies have shown that depressive symptoms were associated with **poor sleep quality and daytime sleepiness** rather than OSA severity.^{5,1}
- A systematic review and meta-analysis found that CPAP treatment in OSA patients resulted in an improvement in depressive symptoms, besides **significant heterogeneity among studies**. The greatest benefit seems to occur in populations with worse depression scores.⁷

Conclusions

- We present a case of a 60 year old man, with depressive symptoms and cognitive dysfunction and comorbid OSA, with recovery of psychiatric symptoms after OSA treatment with CPAP.
- OSA has been associated with a broad range of neuropsychiatric problems, of which **cognitive impairment and depression** are the most widely reported. It is of crucial importance to search for OSA signals when assessing patients with these symptoms, since evidence exists that they may improve with OSA adequate treatment.

¹Bilyukov RG, Nikolov MS, Pencheva VP, et al. Cognitive Impairment and Affective Disorders in Patients With Obstructive Sleep Apnea Syndrome. *Frontiers in Psychiatry*. 2018;7:9:357.²G1agnon K, Baril AA, Gagnon JF, et al. Cognitive impairment in obstructive sleep apnea. *Pathol Biol*. 2014;62(5):233-40.³Bucks RS, Olaithe M, Eastwood P. Neurocognitive function in obstructive sleep apnoea: A meta-review. *Respirology*. 2013;18:61–70.⁴Sforza E, Roche F. Sleep apnea syndrome and cognition. *Frontiers in Neurology*. 2012;23:87.⁵Lee SH, Lee YH, Kim S, et al. Depressive symptoms are associated with poor sleep quality rather than apnea-hypopnea index or hypoxia during sleep in patients with obstructive sleep apnea. *Sleep Breath*. 2017;21(4):997-1003.⁶BaHammam AS, Kendzerska T, Gupta R, et al. Comorbid depression in obstructive sleep apnea: an under-recognized association. *Sleep Breath*. 2015;20(2):447-56.⁷Povitz M, Bolo CE, Heitman SJ, et al. Effect of Treatment of Obstructive Sleep Apnea on Depressive Symptoms: Systematic Review and Meta-Analysis. *PLoS Me*. 2014;25;11(11)