

Analysis of Attention Subdomains in Obstructive Sleep Apnea Patients

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Front Psychiatry. 2018 Oct 4;9:435.

doi: 10.3389/fpsy.2018.00435. eCollection 2018.

Abstract

Background:

Obstructive sleep apnea (OSA) is characterized by apnea-hypopnea during sleep. Overnight polysomnography (PSG) is usually used to detect the frequency of apneic and hypopneic events. Attention and executive deficits are commonly reported in OSA patients. Previous investigations suggested that cognitive impairments were dependent on attention deficits. However, attention is not a unitary domain and consists of different subdomains such as alertness, sustained attention, focused attention, and executive attention (impulsivity/hyperactivity). Little is known about the attention subdomains affected in OSA. Attention is commonly assessed using continuous performance tests, such as the continuous visual attention test (CVAT). Distinct variables can be derived from the CVAT. Each CVAT variable is associated with a specific attention subdomain. Objective: This study aimed to examine the variables of the CVAT that are affected by OSA and to identify the most reliable CVAT variable that distinguishes OSA from controls via discriminant analysis.

Method:

Patients scheduled to perform a PSG were invited to participate in this study. Immediately before the PSG, they performed the CVAT. Based on the PSG results, 27 treatment-naïve OSA patients were sampled. The same number of healthy controls were selected to match the two groups by age and gender. Five CVAT variables were examined: commission errors, omission errors, reaction time (RT), variability of reaction time (VRT), and coefficient of variability (VRT/RT).

Results:

ANCOVAs indicated that RT and VRT were affected by OSA. No difference in accuracy (omission and commission errors) was observed between healthy controls and OSA patients. When the VRT measurements were corrected for their respective RT values (VRT/RT), the mean difference on this coefficient did not reach significance. The discriminant analysis indicated that the two groups could be best differentiated by the RT variable.

Conclusions:

Attention problems, commonly observed in OSA patients, may reflect a primary problem on the alertness subdomain. The CVAT was able to detect the primary (alertness-RT parameter) and the secondary deficits (sustained attention-VRT parameter) associated with OSA. As there is no learning effect in the condition of retests, the CVAT can be used to assess the cognitive recovery in OSA patients during treatment.