Temporal Dynamics of Autonomic Nervous System Responses under Cognitive-Emotional Workload in Obsessive-Compulsive Disorder

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October 16, 2023

Abstract

Dysregulation of the autonomic nervous system (ANS) is commonly observed in different mental disorders, especially when individuals engage in prolonged cognitive-emotional tasks that necessitate an adjustment of the ANS to workload. Although understanding of the temporal dynamics of sympathetic and parasympathetic tones in obsessive compulsive disorder (OCD) is limited, analyzing the ANS reactions on cognitive-emotional workload could provide a valuable insight into the underlying causes of OCD. This study investigated the temporal dynamics of the heart rate (HR) and pupil area (PA) while participants with OCD and healthy volunteers solved antisaccade tasks where affective pictures served as central fixation stimuli. The data of 31 individuals with OCD and 30 healthy volunteers were included in the study. The experiment consisted of three separate blocks, each lasting approximately 8 minutes. The results showed the increase in sympathetic tone in the OCD group. The increase in sympathetic tone of the ANS in OCD at the middle part of the block was most noticeable during presentation of unpleasant stimuli. The healthy volunteers demonstrated adaptive temporal dynamics of the HR and PA from the first block to the last block of tasks, while HR and PA in the OCD group showed less changes in time implying the reduced adaptation of the ANS sympathetic tone to cognitive-emotional workload in OCD.

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