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A FUNCTIONAL ROLE FOR GLOBAL SLOW OSCILLATIONS IN MAJOR DEPRESSIVE DISORDER WITH HYPERSOMNIA

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Introduction: Sleep slow oscillations (SOs, 0.5-1.5Hz) during stages N2 and N3 sleep facilitate cortical communication and are important to the restorative properties of sleep. Spatiotemporal clustering analysis of SOs on the electrode manifold has identified 3 topographically distinct patterns of SOs: Frontal, Local, and Global. Global SOs are spatially widespread cortical events implicated in anterior-posterior long-range communication. However, their precise functional significance is not fully understood. Patients experiencing Major Depressive Disorder (MDD) with comorbid hypersomnia show local deficits in parieto-central slow wave activity, suggesting that frontally-initiated SOs are not propagating to parietal-central regions. Hypersomnolence in MDD may therefore be connected to insufficiently restorative sleep. Here, we retrospectively examine associations between Global SOs in N2 and N3 sleep and hypersomnia severity in healthy controls and MDD patients.
Methods: MDD patients with (n=22) and without (n=22) hypersomnia, and age-gender balanced healthy controls (n=22) underwent overnight polysomnography studies with 256-channel hdEEG. After detection of SOs, our previously developed classification method was applied retrospectively to all SOs in this dataset, including leveraging a k-means clustering algorithm naïve to the MDD/Hypersomnia label. Fractions of global SOs during stages N2 and N3 were compared across healthy controls and MDD patients. Finally, the fraction of global SOs occurring during the night was correlated against all subjects' individual scores on the Hypersomnia Severity Index (HSI).
Results: Analysis of EEG data revealed pronounced, but not statistically significant deficits in global SOs during N3 sleep in MDD patients with comorbid hypersomnia. These deficits were significantly correlated with HSI when examining MDD patients together (Pearson's $r = -0.397$, $p<0.01$).
Conclusion: Our findings suggest that MDD patients with higher hypersomnia severity experience more pronounced deficits in Global SOs. Given the importance of SOs for the restorative properties of sleep, it is possible that MDD patients with hypersomnia might incur an enhanced sleep need driven by the homeostatic cost of a deficit in Global SOs.. Future studies are necessary to investigate causal mechanisms underlying these findings.
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BRIGHT LIGHT EXPOSITION POTENTIATES THE VASODILATION PROMOTED BY DYNAMIC HANDGRIP EXERCISE

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0**Introduction:** Bright light (~5000 lux) directed at human skin increases plasma nitric oxide concentration promoting vasodilation, with increased skeletal muscle blood flow (BF) and decreased blood pressure (BP). The same stimulus directed at the eyes increases sympathetic activity, promoting vasoconstriction and increased BP. If bright light potentiates or mitigates the vasodilation promoted during exercise is unknown. Therefore, this study aimed to compare the effect of different intensities of lights on vasodilation of the active skeletal muscle during dynamic handgrip exercise.
Methods: Eleven healthy and physically inactive adult men (29±6 years) participated of the current study. All experiments were conducted between June and July 2021, beginning at 5 PM and under constant environmental conditions. Subjects performed dynamic handgrip exercise using the dominant arm at a 90º angle in the supine position with 2 s cycles of contraction and relaxation for 6 min at 40% of maximal voluntary contraction during the three experimental condition in a randomized order: (BL) 5000 lux, Control light (CL) 500 lux, and Dim light (DL) ≤8 lux. In each condition, (BL, CL or DL), subjects remained in a rested state for 20 min before 1 min of baseline assessment followed by exercise. Conditions were always separated by 20 min of washout (under CL). Assessments comprised BF, vascular conductance (VC), and diameter of brachial artery of exercising arm (Ultrasound); BP measured in the rest arm (Photoplethysmography) and heart rate (ECG). Two-way ANOVA for repeated measures, $p\leq0.05$.
Results: Baseline were not different ($p>0.05$). During exercise, BF and VC increased in the three conditions, however it was potentiated by BL ($p < 0.0001$ and $p < 0.0001$, respectively) compared with CL (+19% and +15%, respectively) and with DL (+12% and +11%, respectively). Arterial diameter increased similarly in the three conditions. Mean BP increased in the three conditions, however it was attenuated in the BL compared with DL (-23%) and similar to CL (<0.0001).
Conclusion: Bright light can potentiate skeletal muscle vasodilation during a small-mass muscle exercise attenuating the increase of BP.
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DIFFERENCES IN MONOCYTE ACTIVATION BETWEEN PEOPLE WITH TREATED HIV INFECTION WITH OR WITHOUT OSA

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0**Introduction:** Obstructive sleep apnea (OSA) has been associated with low grade systemic inflammation and greater cardiovascular risk, but the specific pathways mediating these effects are unclear. Monocyte activation is implicated in the development of cardiovascular disease in people with treated HIV infection. We sought to evaluate the impact of OSA on monocyte activation in people living with human immunodeficiency virus (HIV) infection.