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OVERNIGHT OXIMETRY IN GENERATIONALLY UN-ADAPTED RESIDENTS OF HIGH-ALTITUDE

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Introduction: A recent population shift has increased residents of high-altitude locations. Additionally, travel infrastructure has created the opportunity for rapid displacement to high altitudes without adaptation. Residing at high-altitude is a physiological challenge, which increases the risk of overnight hypoxia from sleep disordered breathing. Sleep disordered breathing, including sleep apnea, is a risk factor for a variety of additional negative health outcomes. Additional information is needed to understand the physiology of high-altitude adaptation in generationally un-adapted residents and prevent negative health outcomes.

Methods: Healthy residents of high altitude participated in this community-supported observational study. Health and altitude history were gathered. Participants completed one night of overnight oxygen monitoring with finger pulse oximetry. Participants with BMI >30 kg/m², sleep time <4 or >10 hours were excluded.

Results: Total of 41 participants included, 68.3% female, 44.9±13.0 years (SD), BMI 23.7±2.5 kg/m². Participants resided at altitudes between 2500–3048 m. Participants were also characterized by their years at altitude and percent of life spent at altitude, average 15.9±12.2 years (median 13) and average 33.0±21.7% of life at altitude. Neither years or percent of life at altitude were predicted percent of time below 88% O₂ on overnight pulse oximetry (R² = 0.04 and 0.03, both p>0.12). Multiple Linear Regression indicated BMI was the only factor that explained a significant portion of the variance in adaptation (p<0.01).

Conclusion: In a generationally un-adapted population of high-altitude residents, years at altitude and percent of life at altitude do not explain the variance of adaptation to altitude as measured by percent of night spent hypoxic with less than 88% SpO₂. While these data do not provide support for an adaptation response based on time at altitude, they indicate future directions in human altitude adaptation should focus on other covariates, potentially including genetic differences.

Support (If Any):

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PREVALENCE OF INSOMNIA AND/OR OBSTRUCTIVE SLEEP APNEA IN A SAMPLE OF FIT-FOR-DUTY U.S. NAVY SAILORS

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Introduction: Obstructive sleep apnea (OSA) and insomnia are prevalent sleep disorders, known to negatively impact sleep and well-being in civilian populations. Studies of these sleep disorders in military populations have focused on individuals seeking treatment for a sleep disorder, rather than the general active-duty service member (ADSM). In this study, we investigated the prevalence of OSA and insomnia in U.S. Navy sailors serving on surface ships.

Methods: We analyzed pre-collected data from 548 fit-for-duty sailors (MD age=25 years, IQR=9; 79.4% males) serving on nine US Navy surface ships. Sailors reported their demographic information, health-related habits, and whether they had been diagnosed

with OSA and/or insomnia. Sleep was assessed with wrist-worn actigraphy (371 sailors).

Results: Approximately 66.8% of sailors reported having an exercise routine, 83.6% reported drinking caffeinated beverages, and 29.1% used nicotine products. In terms of disorders, 15 (2.7%) male sailors reported having been diagnosed with OSA, 12 (2.2%) with insomnia (8 males, 4 females), and one (0.2%) male sailor with comorbid insomnia and OSA. Compared to sailors without a sleep disorder, sailors with OSA were older (MD=34 years, IQR=7; p<0.001) and had a higher proportion of nicotine users (53.3%) (p=0.041). Sailors with insomnia did not differ from sailors with no sleep disorder in terms of demographics and habits. The average daily sleep duration was 6.4±1.0 hours, which did not differ between disorder groups. However, sailors with insomnia had more sleep episodes per day (MD=1.7; IQR=0.9) than sailors without a sleep disorder (MD=1.3, IQR=0.5; p=0.042).

Conclusion: Only ~5% of the sailors in our study reported a diagnosis of OSA and/or insomnia, whereas one in three people in the general population has a sleep disorder. Notably, all sailors, regardless of sleep disorder diagnosis, exhibited short sleep durations. Previous studies of ADSMs found that ~48% reported poor enough sleep quality to meet the diagnostic criteria for a sleep disorder. Thus, our results suggest that, despite evidence that many Sailors exhibited sleep problems, sleep disorders are significantly underdiagnosed in ADSMs.

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