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ASSOCIATION BETWEEN COMBAT STRESS AND SERUM CORTISOL LEVELS IN UKRAINIAN MILITARY

Background. The mental and physical health of Ukrainians has become a critical concern, as individuals exposed to war are increasingly experiencing significant psychological and social disorders. War-related stress is a powerful pathogenic factor contributing to the development, manifestation, and exacerbation of somatic, mental, and behavioral disorders. A variety of validated psychological tools are currently available for assessing stress exposure and its impact, including the Organizational Stress Scale (McLean, adapted by Vodopyanova), the Holmes–Rahe Stress Scale, the Schreiner Stress Diagnostic Test, and the Blinov Combat Stress Questionnaire.

Objective.

To analyze the relationship between serum cortisol levels and combat stress in military personnel, assessed using the Blinov questionnaire, taking into account the duration of exposure to war-related factors and the time elapsed since leaving the combat zone.

Materials and Methods.

The study included 40 male combat veterans who had not been exposed to active combat conditions for the past 6 months but had participated in combat operations for up to 24 months prior. Serum cortisol levels were measured in the morning (6:00–8:00 AM) after awakening. Combat stress levels were assessed using the Blinov Combat Stress Questionnaire. Statistical analysis was performed using MedStat v.5.2 software. Participants were stratified into four quartiles based on

stress levels.

Results.

Both in the overall cohort (n=40) and across quartiles, a consistent trend was observed: serum cortisol levels decreased with increasing levels of combat stress. This finding aligns with existing literature demonstrating an inverse relationship between cortisol levels and the severity of post-traumatic stress disorder (PTSD). Correlation analysis revealed a significant negative association between stress scores and serum cortisol levels ($r = -0.67$; $t = 10.71$; $p < 0.05$).

Discussion.

It should be noted that participants had not been exposed to combat for the previous 6 months, suggesting that additional adaptive mechanisms beyond cortisol regulation may be involved in the development of PTSD-related changes. Functional antagonists of cortisol, such as dehydroepiandrosterone sulfate (DHEA-S), as well as other hypothalamic–pituitary–adrenal (HPA) axis hormones, may play a significant role. According to current evidence, these biomarkers may serve as more stable and informative indicators of PTSD, influencing metabolism, energy availability, inflammation, and cognitive function.

Conclusions.

An inverse relationship between combat stress and cortisol levels was identified in military personnel, indicating possible dysregulation of the HPA axis in the context of prolonged war exposure. Further research will focus on DHEA-S as a potential biomarker of stress adaptation in military populations.

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