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Adrenal Hormone Changes and Associations with Injury during Marine Corps Officer Candidates School

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Marine Corps Officer Candidates School (OCS) is an arduous, multi-stressor 10-week military training program. Exposure to stress can influence the neuroendocrine system, increasing concentrations of adrenal hormones, such as cortisol (CORT) and dehydroepiandrosterone (DHEA), potentially impacting physical performance. **PURPOSE:** Examine changes in CORT, DHEA, and the DHEA:cortisol ratio (DCR) among men and women, and their relation to injury during OCS. **METHODS:** 1006 OCS candidates (age: 24.8 ± 3.2 yrs; BMI: 25.3 ± 2.3 kg/m²; 20.5% women) completed a blood collection before and after the 10-week training program. Musculoskeletal injury (MSKI) data was obtained from OCS staff records. Serum CORT and DHEA concentrations were analyzed using enzyme-linked immunosorbent assays. Statistical analysis was conducted using two-way mixed-measures ANOVAs (time*sex) for CORT, DHEA, and DCR. Biomarker concentrations were compared to injury occurrence using independent samples *t* tests; $\alpha = 0.05$. **RESULTS:** DHEA and DCR had no significant time*sex interactions or main effects. There was a significant interaction effect for CORT concentrations ($p < 0.001$, $\eta^2 = 0.027$). Both men and women illustrated a significant decrease in CORT concentrations from pre- to post-testing, with significantly lower CORT concentrations at post-testing in women compared to men (men: pre = 10.673 ± 3.772 $\mu\text{g/dL}$, post = 9.559 ± 0.198 $\mu\text{g/dL}$, $\Delta = -10.44\%$; women: pre = 11.059 ± 4.750 $\mu\text{g/dL}$, post = 7.900 ± 0.385 $\mu\text{g/dL}$, $\Delta = -28.56\%$; $p < 0.001$). None of the analytes were significantly different between MSKI and non-MSKI participants. **CONCLUSION:** Decreases in CORT, but not DHEA, were observed in men and women following the 10-week training program. These changes were increasingly evident among women, indicating that changes in stress among Officer candidates may be sex-dependent. **SIGNIFICANCE/NOVELTY:** Sex-dependent stress responses provides valuable insights into soldier readiness and could influence physical and physiological performance. Moreover, decreases in CORT concentrations could be indicative of adrenal fatigue caused by chronic stress throughout training.

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