

# DIURNAL VARIATION OF CORTISOL, TESTOSTERONE, AND THEIR RATIO IN APPARENTLY HEALTHY MALES

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## **Abstract**

*The aim of the present study was to investigate whether a certain time of day may be more or less catabolic or anabolic than another and therefore of greater adaptive potential after exercise. Eighteen male university students volunteered to participate in the study. Salivary specimens were collected every 60 min over a 12 h waking period and then measured with the Salimetrics HS-cortisol assay and Salimetrics HS-testosterone assay. Participants remained at rest and were fed identical meals to each other at 08:05, 13:05, and 18:05 h. Blood pressure, heart rate and core temperature were observed every 15 min. Elevated cortisol concentrations were observed in the morning between 08:00 and 09:00 h (mean concentration  $\pm$  SD =  $0.28 \pm 0.17$  ug/dL) and a nadir in the evening or early night-time, between 17:00 and 20:00 h (mean concentration  $\pm$  SD =  $0.12 \pm 0.06$  ug/dL). Post hoc analysis revealed that mean 08:00 h cortisol was significantly greater than mean cortisol at 11:00 to 20:00 h ( $P < 0.05$ ) and mean 09:00 h cortisol was significantly greater than mean cortisol from 15:00 to 20:00 h ( $P < 0.05$ ). However, testosterone did not change significantly during the same period. Cortisol, core temperature and systolic blood pressure correlated significantly (although not strongly) with sampling time. In conclusion, salivary sampling to assess the anabolic/catabolic status of a squad or individual or to diagnose overtraining may not be simple or feasible as the variation between individuals is high and therefore setting a threshold value would prove troublesome. Also, the episodic release of cortisol in particular increases the difficulty of deciding a value in healthy or subclinical individuals.*

**Keywords:** Anabolism; Catabolism; Biological variation; Circadian rhythms