

# Effects of Psychosocial Stress on DHEA and DHEA-S levels

## Acute and Long-term effects

### AKADEMISK AVHANDLING

som för avläggande av medicine doktorsexamen vid Sahlgrenska Akademin vid Göteborgs universitet kommer offentligen försvaras i hörsal Arvid Carlsson, Medicinaregatan 3, Göteborg, onsdagen den 12 juni 2013 kl. 13.00

av

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Avhandlingen baseras på följande arbeten:

- I. Lennartsson AK, Kushnir MM, Bergquist J, Jonsdottir IH. DHEA and DHEA-S response to acute psychosocial stress in healthy men and women. *Biological Psychology* 2012 May;90(2):143-9. Epub 2012 Mar 13.
- II. Lennartsson AK, Theorell T, Kushnir MM, Bergquist J, Jonsdottir IH. Perceived stress at work is associated with attenuated DHEA-S response during acute psychosocial stress. *Psychoneuroendocrinology* 2013 Feb 18 [Epub ahead of print].
- III. Lennartsson AK, Theorell T, Rockwood A, Kushnir MM, Jonsdottir IH. Perceived stress at work is associated with lower levels of DHEA-S. *Submitted for publication*



UNIVERSITY OF GOTHENBURG

Göteborg 2013

# **Effects of Psychosocial Stress on DHEA and DHEA-S levels**

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### **ABSTRACT**

Background: Long-term psychosocial stress can cause and contribute to a wide range of psychological and somatic conditions, and accelerate aging. One of the consequences of long-term psychosocial stress may be a reduction in the levels of dehydroepiandrosterone and its sulphated metabolite dehydroepiandrosterone sulfate (DHEA-S). The aim of this thesis was to investigate the effects of acute and long-term psychosocial stress on serum levels of DHEA and DHEA-S in otherwise healthy men and women. Method: In Paper I, 39 healthy individuals went through a stress test (Trier social stress test). Blood samples were collected before the stress test, immediately after the stress test and after 30 minutes of recovery. Mixed between-within ANOVAs were used to investigate the responses of DHEA and DHEA-S. Thirty-six of the 39 participants in Paper I answered a questionnaire regarding long-term stress (perceived stress at work) and were included in Paper II. DHEA and DHEA-S response during acute stress were compared between groups of individuals who reporting different levels of long-term stress (Low, Medium, High) using ANCOVA. The Low stress group, which did not experience any stress at work, was used as reference group. In Paper III, morning DHEA-S and DHEA levels were measured in serum in 41 stressed and 40 non-stressed individuals. The groups were defined based on their scores on the questionnaire measuring long-term stress (perceived stress at work). DHEA and DHEA-S levels were compared between the groups using ANCOVA. Results: While acute psychosocial stress increases the levels of DHEA and DHEA-S temporarily (Paper I), long-term psychosocial stress is associated with reduced capacity to produce DHEA-S during acute stress (Paper II) and lower basal DHEA-S levels (Paper III). Conclusions: Considering the beneficial effects that DHEA and DHEA-S have and the fact that low DHEA and DHEA-S levels are associated with adverse health, the findings of this thesis suggest that one of the links between long-term stress and adverse health could be that long-term stress reduces the capacity to produce DHEA-S.

Keywords: Psychosocial stress; Acute and Long-term stress; Work stress; DHEA; DHEA-S

ISBN 978-91-628-8690-5