Cortisol Awakening Response in patients with Social Anxiety Disorder

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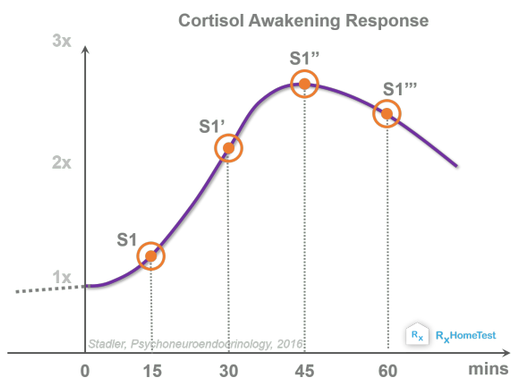
Introduction

Anxiety disorders are the most prevalent psychiatric disorder, but their cause is not yet fully understood. The identification of mechanistically-oriented biomarkers could add to our understanding of the neurobiology and help guide improvements in treatment selection. The Hypothalamic-Pituitary-Adrenal (HPA) axis controls our stress response with activation leading to the secretion of cortisol. The cortisol awakening response (CAR), which is the rise in cortisol on awakening, has been used as a measure of HPA axis reactivity. While some studies have found differences in the CAR between patients with anxiety disorders and healthy controls (HC), the results are inconsistent.

The primary objective of this study was to ***investigate the differences in the CAR between patients with social anxiety disorder (SAD) and HC.*** The secondary objective was to ***investigate whether the CAR was related to anxiety symptom severity.***

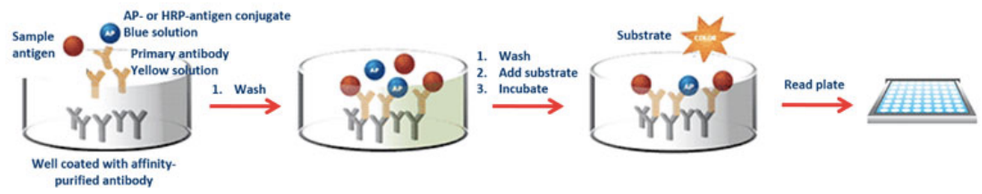


RxHomeTest. "Morning Cortisol and Impact of Accurate Collection Time - RxHomeTet," August 5, 2020. https://www.rxhometest.com/morning-cortisol/.

Methods

This is an observational study. 35 patients with a clinical diagnosis of SAD and 39 HCs were recruited. Patients were assessed by a psychiatrist and the diagnosis of SAD, based on the Diagnostic and Statistical Manual of Mental Disorders (DSM–5) criteria, was confirmed using the Mini-International Neuropsychiatric Interview version 7.0.2. Participation involved one study visit where patients completed self-report measures, which included the Generalized Anxiety Disorder 7-Item Scale (GAD-7), Perceived Stress Scale (PSS), Panic and Agoraphobia Scale (PAS) and the State-Trait Anxiety Inventory (STAI). Participants produced four morning saliva samples (on awakening, 30, 45 and 60 minutes after awakening). Salivary cortisol levels were determined using an Enzyme-linked immunosorbent assay (ELISA).

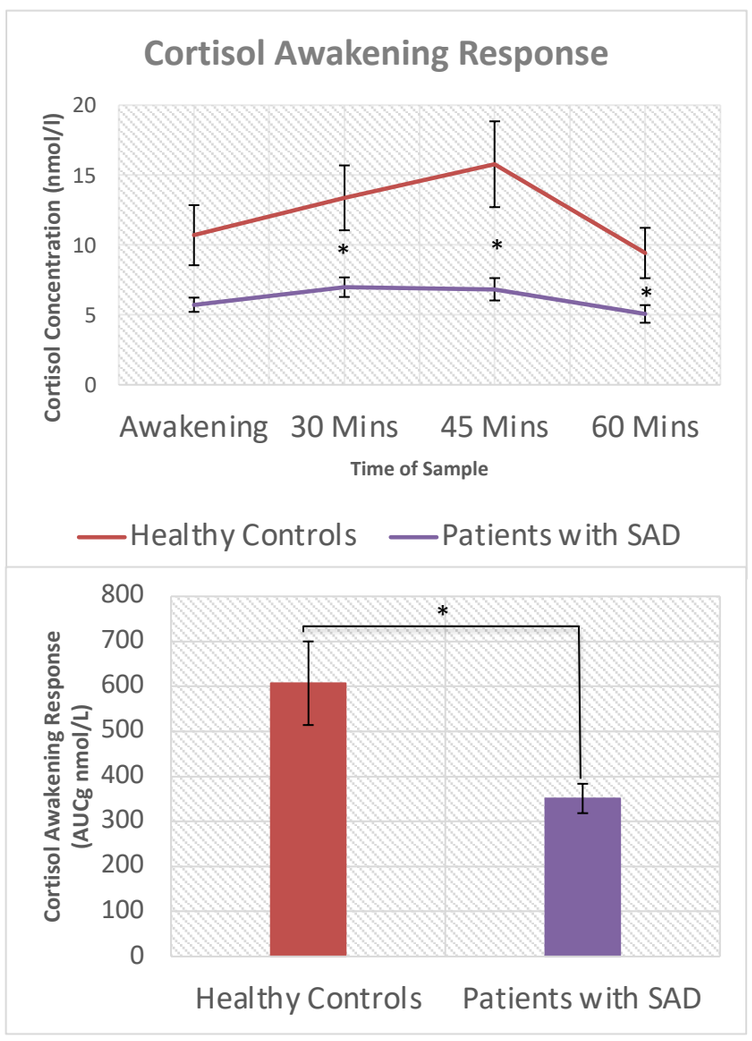
Any data that were not normally distributed were transformed using square-root transformation. Independent-sample t-tests were used to explore differences between groups and correlation analysis was performed using Spearman's rank correlation coefficient.



"What Are the Differences between ELISA Assay Types? - Enzo Life Sciences." Accessed October 6, 2020. https://www.enzolifesciences.com/science-center/technotes/2017/april/what-are-the-differences-between-elisa-assay-types?/.

Results

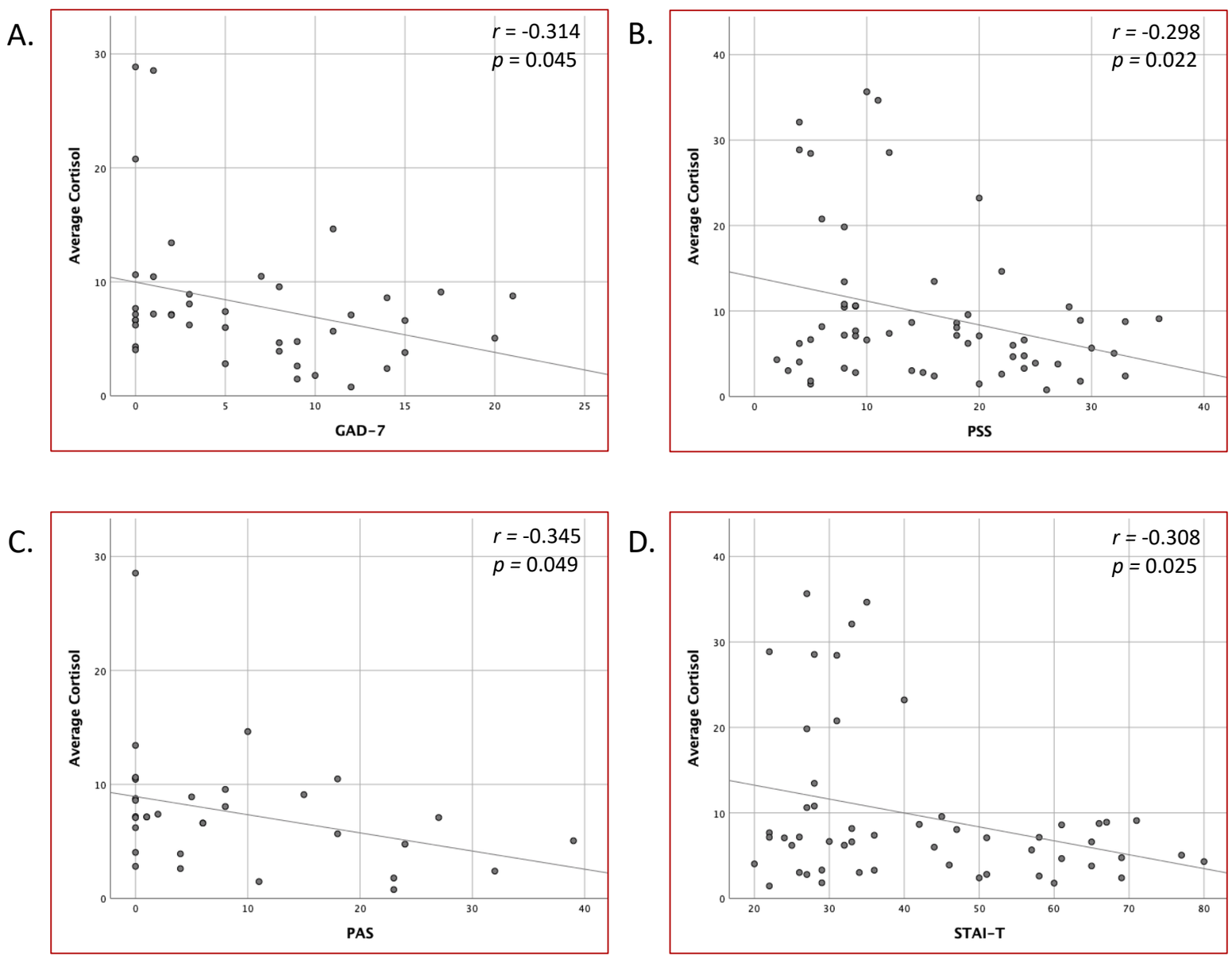
***Figure 1*: Morning cortisol levels and CAR are significantly lower in patients with SAD**



(A): No difference between groups on awakening (p=0.107) but significant differences seen at 30 (p=0.008), 45 (p=0.006) and 60 (p=0.047) minutes. **(B)**: Area under the curve with respect to ground (AUCg) analysis on salivary cortisol samples at each time-point. AUCg was significantly higher in HCs (p = 0.049)

* = p < 0.05. Data is presented as mean ± standard error of the mean of raw data.

***Figure 2*: Average morning cortisol is negatively correlated with measures of anxiety and stress**



When analysing all participants, the average morning cortisol was *negatively* correlated with the GAD-7 **(A)**, PSS **(B)**, PAS **(C)** and STAI-Trait **(D)**. This suggests that the CAR may be able to predict anxiety symptom severity (GAD-7, PSS, PAS, STAI-T)

Conclusions

Considering that the age of onset for SAD is normally adolescence, our findings are consistent with the theory that chronic anxiety leads to the down-regulation of the HPA-axis. Longitudinal studies comparing cortisol levels in acute and chronic cases of social anxiety disorder are needed to expand on these findings and to understand how this dysfunctional stress physiology contributes to the pathophysiology of anxiety disorders.

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