



Serum Cortisol does not Predict Rate of Cognitive Decline in Alzheimer's Patients

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Introduction

- Chronic activation of the HPA axis brought on by prolonged stress, and concomitant increased cortisol levels, can lead to damage to the hippocampus and dysregulation of the HPA axis.
- The presence of this process is well established in Alzheimer's disease (AD).
- However, disagreement exists on what role this increased cortisol plays in the progression of the disease.
- It was hypothesized that higher levels of serum cortisol would predict greater rate of decline in functioning in future years.

Participants

Archival data was obtained from the Baylor College of Medicine Alzheimer's Disease and Memory Disorders Center in Houston, Texas and the Texas Alzheimer's Research and Care Consortium. Subjects were 40 patients with a diagnosis of probable AD.

Methods

- Serum cortisol was measured (in ng/ml) using multiplexed immunoassay human Multi-Analyte Profile by Rules-Based Medicine (Austin, TX). APOE genotype was also determined.
- Patients were administered a neuropsychological battery which included measures of memory (WMS-R Logical Memory and Visual Reproduction I and II), language (Boston Naming Test, FAS), attention (VSAT), visuospatial functioning (Block Design), and dementia severity (MMSE, CDR-Sum of Boxes). This battery was repeated yearly for 2 to 4 years.

Results

- Growth curve analysis within a multilevel fixed effects model framework was used to predict the decline in performance on neuropsychological tests and disease progression.
- Serum cortisol levels did not significantly predict the decline in functioning in any of the neuropsychological measures or the increase in disease severity.

- Inclusion of APOE e4 status as a predictor moved results closer to, but did not reach, significance for increase in CDR –Sum of Boxes. ($b = 2.02$, $p = .09$)

Conclusions

- Higher cortisol levels did not predict an increased rate of decline in AD patients' neuropsychological test scores or dementia severity, implying there is not a substantial relationship between the physiological stress response and disease progression.
- Analyses did suggest that APOE e4 carriers with high cortisol levels may exhibit more rapid increase in dementia severity, but this possible effect needs to be demonstrated in future, more statistically powerful studies.