

Abstract Submission No. : 1188

The prevalence of adrenal insufficiency in hemodialysis patients according to low-dose and standard-dose ACTH stimulation tests

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Objectives: Diagnosing adrenal insufficiency (AI) on hemodialysis is often challenging because many of their symptoms are similar to those caused by AI. In this study, we compared the prevalence of AI as determined by low-dose and standard-dose adrenocorticotrophic hormone (ACTH) stimulation tests in patients on hemodialysis.

Methods: Ninety HD patients not receiving steroid replacement therapy were enrolled. Both low-dose (1 µg) and standard-dose (250 µg) ACTH stimulation tests were performed at a 1-week interval to evaluate AI. A normal response in both tests was defined as a rise in albumin (3.4 mg/dL) - adjusted serum cortisol concentration to a peak of ≥ 18 µg/dL.

Results: Among the 90 patients, 44 (48.9%) were men, and the mean age was 63.0 ± 10.3 years. One or more AI-related symptoms and signs were reported in 84 (93%) patients. We compared 43 (47.8%) and 17 patients (18.9%) who (overlap was allowed) had positive results from the low-dose test and the standard-dose test, respectively. No significant between-group differences were found in the frequencies of AI-related history, symptoms, and signs. Furthermore, no significant difference was found in the mortality rate between patients who were positive on the low-dose or standard-dose tests and those who were negative. However, incidence of steroid replacement therapy was significantly more common in patients who tested positive on either test. The low-dose test showed a sensitivity of 0.29 and a specificity of 0.60 for predicting steroid replacement therapy, while the standard-dose test showed a sensitivity of 0.24 and specificity of 0.82.

Conclusions: AI-related symptoms and signs are of little help in diagnosing AI in patients on hemodialysis. The frequency of AI patients diagnosed by the low-dose ACTH test was very high, and this test showed diagnostic value for predicting steroid replacement therapy and discovering AI patients among patients on hemodialysis.