ACTH stimulation test (250 µg): Is salivary cortisol an alternative to serum cortisol?

Lara Albert1, Olga Giménez-Falop1, Ismael Capel1, Jose Miguel González-Clemente1, David Subias1, Jorge Sánchez-Delgado1,2, Joaquim Profitós1, Eugenio Berlanga3, Laia Casarníjana1, Mercedes Riga1. 1Servei d’Endocrinologia i Nutrició. Hospital de Sabadell. Corporació Sanitària Parc Taulí. Institut Universitari Parc Taulí. UAB. 2 Servei d’Hepatologia. Hospital Parc Taulí. 3Centro de Investigación Biomédica en Red de Enfermedades Hepáticas y Digestivas (CIBERehd). Instituto de Salud Carlos III. 4 Servei d’analisi clínic. UDIAT. Hospital Parc Taulí.

Introduction and objectives

- Most serum cortisol is linked to cortisol binding globulin (CBG) and albumin. When the synthesis of proteins is reduced or increased, serum cortisol (SeC) doesn’t reflect the actual free cortisol (FC) (active fraction). Methods for FC analysis are very laborious and expensive, which makes difficult to use them as a routine laboratory tests.
- Salivary cortisol (SaC) mirrors the FC in serum, being its measurement easier and cheaper. The determination of SaC, instead of total cortisol after stimulation with ACTH has been proposed as an alternative for adrenal insufficiency diagnosis, but this test has not been standardized yet.
- The goal of this study is to determine the reference values for SaC after stimulation with 250 µg of ACTH IV and their correlation with those for SeC.

Methods

- Forty-five healthy volunteers and 39 patients with known adrenal insufficiency (13 primary, 26 secondary) were included.
- After at least 8 hours fast, serum and saliva samples were collected by chewing for 1-3 minutes the cotton swab Salivette® before and after the administration of 250 µg of ACTH IV for the determination of cortisol in times: 0’, 30’, 60’ and 90’.
- Patients received their last dosage of hidrocortison at 09:00h the day before.

Results

Salivary cortisol before and after 250 µg ACTH iv

![Graph showing salivary cortisol before and after ACTH stimulation test.]

Correlation

![Graph showing correlation between serum and salivary cortisol.]

- All healthy volunteers had a serum cortisol peak at 30 min ≥18 µg/dL
- The salivary cortisol correlated with serum cortisol at all times, except in time 0’ for the group of patients.
- Healthy volunteers lower limit value salivary cortisol at 60 min was 1.43 µg/dL.
- This cut-off classified all patients correctly.

Conclusions

- Measurement of salivary cortisol offers an alternative to serum cortisol ACTH stimulation test (250 µg).
- We suggest that adrenal insufficiency can be excluded when salivary cortisol at 60’ is ≥ 1.43 µg/dL.

References


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