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The Use of Salivary Cortisol and Cortisone in the Diagnosis of Cushing's syndrome

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Introduction

Endogenous Cushing's syndrome results from excessive glucocorticoid production from the hypothalamic-pituitary-adrenal axis. It is difficult to diagnose Cushing's syndrome correctly due to non-specific clinical manifestations and lack of a single biochemical test to serve as a gold standard for diagnosis.

The Endocrine Society's Clinical Practice Guidelines had recommended late night salivary cortisol as one of the screening tests for Cushing's syndrome. Local data on diagnostic performance on late night salivary cortisol measured by LC-MS/MS is however lacking. This prompts us to study its sensitivity, specificity and the optimal cutoff value.

Objectives

The aim of this dissertation is to assess the diagnostic performance of salivary cortisol and salivary cortisone in the diagnosis of Cushing's syndrome, and identify the optimal cutoff values in our local Chinese population.

Methodology

This is a prospective study to evaluate the role of salivary testing in patients referred for assessment of hypercortisolism using a protocol of biochemical investigations including blood, salivary and urine samplings.

Result

101 patients were recruited, yielding 111 sets of biochemical investigations for analysis. 14 patients were classified as 'disease group' (8 adrenal Cushing, 3 pituitary Cushing, 3 ectopic ACTH syndrome) according to predefined criteria. 45 patients who had normal overnight dexamethasone suppression test, normal 24 hours urine for free cortisol and normal 24 hours urine for steroid profile were classified as 'control group'. 42 patients were categorized as 'indeterminate group' and their results were excluded from subsequent analysis, because of discordant or borderline results, and absence of suggestive clinical features.

For making a diagnosis of Cushing's syndrome, the optimal cutoff values for late-night salivary cortisol, late-night salivary cortisone, post-ONDST salivary cortisol and post-ONDST salivary cortisone, when measured by LC-MS/MS, are 2.85 nmol/L (AUC 0.943, sensitivity 83.3%, specificity 93.3%), 9.8 nmol/L (AUC 0.922, sensitivity 100%, specificity 73.7%), 1.15 nmol/L (AUC 0.979, sensitivity 92.9%, specificity 97.8%) and 5.9 nmol/L (AUC 1.000, sensitivity 100%, specificity 100%) respectively. At these cut-off values, the late night salivary cortisol, ONDST salivary cortisol and ONDST salivary cortisone all showed good diagnostic performance.