Radiological formula for differentiating between secreting and non-secreting adrenal adenomas


Introduction
Benign adenoma is the most common mass among adrenal incidentalomas. A mild increase in cortisol secretion is noted in up to 30% of patients.

Objectives
* investigate whether a relationship exists between radiological and endocrine parameters in patients with typical and atypical adenomas;
* investigate whether radiological parameters may predict subclinical glucocorticoid secretion excess.

Hormonal assessment
* Cortisol and ACTH samples were taken between 08:00 and 09:00 a.m. after a 12 hr overnight fast
* On the same day, 1mg dexamethasone was administered at 11:00 p.m
* Blood samples were taken the following morning (08:00-09:00 a.m.), after a 12 hr overnight fast, for cortisol measurement

Results

Post-dexamethasone suppression test cortisol (post-DST cortisol) values > 50 nmol/L were used to discriminate patients with adenomas associated with subclinical hypercortisolism (secreting adenomas, SA) from non-secreting adenomas (NSA).

Adrenal CT protocol
* unenhanced scan;
* arterial phase (45 sec after the i.v. injection of iodine contrast medium);
* venous phase (60 sec after the injection);
* delayed examination after 15 mins

Results of univariate and multivariate logistic regression between radiological parameters and post-DST cortisol

<table>
<thead>
<tr>
<th>Variable</th>
<th>NSA (n=28)</th>
<th>SA (n=9)</th>
<th>A-NSA (n=11)</th>
<th>A-SA (n=7)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>59.8±12.1</td>
<td>64.9±8.5</td>
<td>55.4±14.3</td>
<td>55.9±11.7</td>
<td>0.302</td>
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<tr>
<td>Female gender</td>
<td>18 (64.3%)</td>
<td>6 (66.7%)</td>
<td>8 (72.7%)</td>
<td>7 (71.4%)</td>
<td>0.957</td>
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<tr>
<td>Cortisol after DST (nmol/L)</td>
<td>28.6±10.3</td>
<td>91.0±51.1</td>
<td>27.0±9.4</td>
<td>76.5±10.9</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

NSA: non-secreting adenoma; SA: secreting adenoma; A-NSA: atypical non-secreting adenoma; A-SA: atypical secreting adenoma; BMI: body mass index. *P<0.05 SA vs NSA and A-SA vs A-NSA.

The normalized values of both ACTH and cortisol after dexamethasone-suppression test (DST) were used in the analysis. One-way ANOVA. Pearson chi-square.

Conclusions
* We confirmed that secreting adenomas, both typical and atypical, have larger dimensions than non-secreting adenomas;
* Significant relationship between post-DST cortisol and the minimum diameter of the mass and the HU value in E phase. As known, HU in E phase corresponds to the vascularization of the lesion.
* Thus, we hypothesized that a better nodular definition and a higher vascularization of the adenoma might correspond to a higher functional activity.
* The score could have a practical implication, since the radiologist might define not only the radiological characteristics of the mass but he might also predict the expected subclinical glucocorticoid secretion.

References