Session Physiologie Rénale

Impact and interest of implementing the EKFC Formula over CKD-EPI forestimating GFR in automated eGFR reporting within laboratory practice

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Introduction
The automatic reporting of eGFR for all creatinine (Pcr) determination is mandatory and the CKD- EPI2009 formula is considered the most accurate. However, CKD-EPI is inadequate in young adults andis debated in the elderly. The European-Kidney-Function-Consortium (EKFC) equation provides continous eGFR from 2 years to elderly. Our objective was to assess the impact of using the EKFC compared to CKD-EPI.
Methods
We retrieved data from the laboratory database, including gender, age, and Pcr for all patients over 18years in November 2023. eGFR was calculated using the CKD-EPI and the EKFC. Results were expressed as the mean bias between EKFC and CKD-EPI (as reference) according to age groups.
Results
10,066 patients (50.5% females, mean age 56.0±21.2years [18.0-106.7]) underwent Pcr determination (mean 84.7±72.3µmol/L) with 1,706 (16.9%) and 405 (4.0%) having a GFR<60 or <30ml/min/1.73m2, respectively. Bias EKFC-CKD-EPI was small -3.3±3.1ml/min/1.73m2 in the 40-70 years group whereas it was increased both in young adults and elderly (-16.4±5.1, -6.2±4.6 and -6.9±3.6ml/min/1.73m2 in the18-25, 25-40 and > 70 years groups, respectively). Proportion of misclassified patients < 60 is small, except in the elderly (9.3%) when CKD-EPI is considered less accurate.
Discussion/Conclusion
The use of EKFC in laboratories to estimate eGFR offers continuous GFR estimation from 2 years toelderly and could be an alternative to CKD-EPI. The automatic reporting

of eGFR with EKFC by laboratories could allow for an earlier diagnosis of CKD and initiation of nephroprotection in young adults and elderly.

Physiological insights from steroid hormones assays directly in adrenal tissues

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Introduction

Adrenal steroidogenesis relies on a cascade of enzymatic reactions starting from cholesterol as initial substrate and generating multiple steroid precursors to ultimately produce cortisol, aldosterone or androgens. These final steroid hormones and their precursors can be detected in blood at various concentrations, depending on the hormone and on the physiological/pathological condition. Steroid profiles classically performed in blood provide a limited insight into adrenal steroidogenesis, altered by the mixing with gonadal steroids and by the steroid peripheral catabolism. Our aim was thus to measure steroid profiles directly in normal adrenal cortex and in adrenocortical tumors.

Materials and methods

Fifty-five samples of fresh-frozen adrenocortical tissues were included: 9 samples of normal adrenals (CT), 22 samples from adrenocortical carcinomas (ACC) and 24 samples from adrenocortical adenomas (10 cortisol-producing (CPA) and 14 non/mild autonomous cortisol secreting adenomas (NFAT/MACS).A profile of 13 steroids was determined in LC-MS/MS in tissue extracts.

Results

Steroid levels were much higher in normal adrenal tissue samples than in blood. In the glucocorticoid pathway, median concentration ratios between tissue and blood ranged from 10 to 1800 with lower ratiosfor distal steroid products (cortisol) than for precursors (17-hydroxyprogesterone), suggesting a facilitated export of bioactive products. In adrenocortical tumors, steroids levels were lower in ACC thanin benign adenomas' tissues. Intra-tissular cortisol levels were correlated with adrenal differentiation score based on gene expression.

Discussion

The differences in concentration ratios between tissue and blood for distal products and precursors suggest a fine regulation of steroid export. Adrenal steroidogenesis reflects adrenal differentiation.