Excluding hypoadrenalism with unstimulated serum cortisol measured using Roche cortisol gen II

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INTRODUCTION

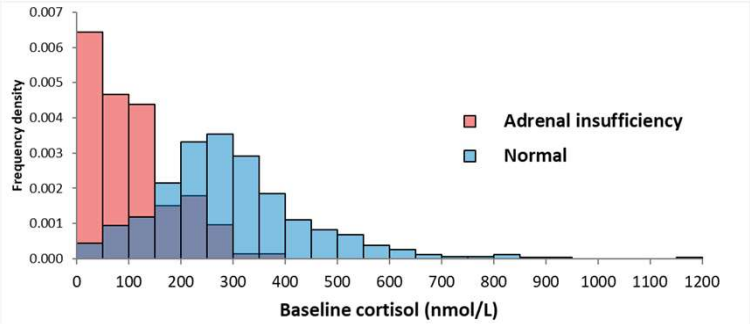
Screening for hypoadrenalism is routinely performed using the short Synacthen test. An unstimulated serum cortisol is considered to have poor diagnostic accuracy, due to large biological and diurnal variation. Nonetheless, previous studies have suggested unstimulated cortisol can be used to exclude hypoadrenalism, at least in non-critically ill patients. The cut-off varies with analytical method used, patient population studied, and timing of the sample. These factors must be considered when applying a literature cut-off. As far as we know the use of unstimulated cortisol to exclude hypoadrenalism has not been validated using the Roche cortisol generation II assay (used in our centre), therefore we undertook this study in our patient population.

METHODS

All STT performed between April 2019 and June 2020 were extracted from the LIMS. Hypoadrenalism was defined as an inadequate response to Synacthen: peak cortisol (30 or 60 min post) <420 nmol/L.

RESULTS

There were 786 patients with valid SST (both unstimulated and at least 1 stimulated cortisol results available). The population was a mixture of outpatients/day-cases (67%) and inpatients (33%). The SST start time was spread throughout the day, with an early morning (8-10am) unstimulated cortisol in 33% of cases. Hypoadrenalism was diagnosed in 146 (19%) patients. The highest unstimulated cortisol in a patient with hypoadrenalism was 356 nmol/L (peak 382 nmol/L at 60 min). Unstimulated cortisol ≥350 nmol/L had 99.3% specificity and 27.7% sensitivity for excluding hypoadrenalism. Because of the wide overlap of unstimulated cortisol results in hypoadrenal and normal patients, we cannot define a lower cut-off below which hypoadrenalism can be predicted.



DISCUSSION

These results validate unstimulated cortisol ≥350 nmol/L cut-off for excluding hypoadrenalism using the Roche cortisol II assay, and confirm that it should only be used as a rule-out test.