

40. EFFECTS OF AN ACUTE CALCIUM LOAD ON PLASMA ACTH, CORTISOL, ALDOSTERONE AND RENINE ACTIVITY (RA) IN MAN.

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A simultaneous and marked increase of plasma ACTH, Cortisol, and Aldosterone without elevation of plasma RA was observed in 10 normal subjects, 1 parathyroidectomized and 5 totally thyroidectomized patients after a 12 min. infusion of calcium gluconate (0.15 mmol/kg bw). There was no hormonal change in 6 normal subjects and 4 totally thyroidectomized patients investigated again under identical conditions except for Ca^{2+} administration. In 2 other normal subjects infused with Ca^{2+} after pretreatment by dexamethasone, only an increase in plasma Aldosterone was observed. These results show that the stimulatory effect of Ca^{2+} on plasma ACTH, Cortisol and Aldosterone is not mediated by changes in Parathyroid Hormone or Calcitonin secretions. They also show that Ca^{2+} sensitive-plasma Aldosterone does not depend on ACTH secretion or plasma RA.

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41. EFFECT OF PROSTAGLANDINS ON STEROID SECRETION BY HUMAN FETAL ADRENAL TISSUE

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In the present investigation we evaluated the effect of prostaglandins on the rate of steroid secretion by human fetal adrenal (HFA) tissue maintained in organ culture for 5 days. Prostaglandins F_2 and E_2 (10 μ g/ml) were added to the culture medium in the presence or absence of ACTH (1 μ g/ml). The medium was changed daily and assayed for content of cortisol (F), dehydroisoandrosterone sulfate (DS) and pregnenolone sulfate (PS) by RIA. When HFA tissue fragments were maintained in the absence of ACTH, F secretion was low; and PGF_2 but not PGE_2 suppressed F secretion by 50-65%. When ACTH was added to the culture medium, the secretion rate of F increased 15 fold, whereas DS and PS secretion was maintained at or near initial rates of secretion. The addition of PGF_2 to the culture medium resulted in a 80% decrease in F secretion in the presence of ACTH, but PGE_2 only suppressed F secretion by 50%. In contrast PGE_2 or PGF_2 did not significantly affect the rate of DS or PS secretion either in the presence or absence of ACTH. In conclusion, prostaglandins appear to inhibit F, but not DS or PS secretion by the HFA. Since we have shown recently that prostaglandins are synthesized by HFA tissue *in vitro*, these results are suggestive of a mechanism whereby the pattern of steroid secretion by the HFA is regulated in part by prostaglandins.

42. SALIVA CORTISOL MEASUREMENTS - A RELIABLE INDICATOR OF ADRENAL CORTEX FUNCTION

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We have examined the efficacy of using saliva cortisol concentration as an indicator of plasma "free (unbound) cortisol" concentration and thus of pituitary-adrenal cortical function. Whole saliva and serum were collected from normal adults and pregnant women. The samples were assayed for cortisol by radioimmunoassay and the percentage of free cortisol determined by centrifugal ultrafiltration.

Saliva cortisol was highly significantly correlated with the serum free cortisol concentration and exhibited a marked non-linearity in its relationship to total serum cortisol. In the commonly used tests of pituitary-adrenal cortical function, dexamethasone suppression, ACTH stimulation and diurnal variation, the response in saliva cortisol concentration reflected the established responses in total serum cortisol but was often quantitatively much larger.

Since it is the free cortisol fraction of plasma which is biologically active, we suggest that measurement of the saliva cortisol concentration as an index of the plasma "free cortisol" provides a simpler and more meaningful index of pituitary-adrenal cortical function, than does the more commonly measured serum (total) cortisol concentration.