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The role of stress related aldosterone secretion in essential hypertension

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Introduction: Approximately 90% of the hypertensive population is characterized as having essential hypertension. Apart from renin and K^+, ACTH plays an important role in aldosterone secretion, being a potent stimulant under situations of stress. Up to date, the association between stress and aldosterone-related hypertension has not been studied and that is the aim of our study.

Methods: 36 hypertensive patients and 14 matched for age and sex controls (BP <140/90 mmHg), had baseline biochemical profile, TSH, cortisol, ACTH, aldosterone, active renin and 24 hr urine Na^+/K^+ measurements, followed by a Bruce protocol exercise test aiming at the 80% of maximal effort according to Froelicher normograms and repeated the hormonal profile at peak exercise. 17 hypertensines and 7 controls had a 0.03 mcg ACTH stimulation test. Hypertensive patients on treatment were switched to a calcium channel blocker for at least 3 weeks before. Exclusion criteria were any cause of secondary hypertension, renal, hepatic or heart failure, ischemic heart disease and diabetes mellitus. CT scan of the adrenals was performed in both groups.

Results: Exercise test: baseline ACTH and aldosterone to renin ratio (ARR) did not differ but at peak exercise hypertensives had statistically higher ACTH and ARR levels compared to controls [35.97±5.59 (mean±S.E.M.) vs 23.24±4.25 pg/ml, *P*=0.046 and 138.83±34.22 vs 55.22±34.45 pmols/L/pg/ml, *P*=0.015].

0.03 mcg ACTH test: there was a trend towards higher values in ARR at peak in hypertensives that did not reach statistical significance probably due to the low number of patients.

Conclusions: Using an exercise test at sub maximal effort in order to mimic every day's life physical stress, we observed a higher response of aldosterone to stress in patients with hypertension. **Therefore, stress related aldosterone hyper secretion may play a causative role in essential hypertension with major implications in its treatment.**