

## Neurotransmitters II

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Glucocorticoids are required for the normal functioning of chromaffin cells and their capacity to produce epinephrine. This was modeled in a unique clinical syndrome of isolated glucocorticoid deficiency due to unresponsiveness to ACTH. The working hypotheses were that in patients with isolated glucocorticoid deficiency, adrenomedullary epinephrine would be suppressed despite replacement therapy; that norepinephrine might show a compensatory response; and that the physiological response to stress would reflect these changes. Toward these hypotheses, patients with ACTH unresponsiveness on glucocorticoid replacement were subjected to three levels of acute stress: assumption of upright posture, cold pressor, and exercise. Their catecholamine and physiological response were monitored. Patients with isolated glucocorticoid deficiency of this study had severe adrenomedullary dysfunction, characterized by a minimal resting production of epinephrine ( $6 \pm 2$  pg/ml compared with  $64 \pm 22$  pg/ml of the controls) and a minimal response to stress. A slight compensatory increase of norepinephrine was found in response to cold pressor test ( $754 \pm 200$  pg/ml compared with  $431 \pm 73$  pg/ml of the control). The physiological response is characterized by low systolic blood pressure and high pulse rate in rest and mild stress and in a pressor response to exercise (diastolic  $87 \pm 5$  mm Hg, compared with  $73 \pm 2$  mm Hg of the control). It is concluded that intra-adrenal glucocorticoids are essential for epinephrine secretion, that norepinephrine may be compensatory, and that these result in a distinct physiological response. The implications of the pressor response to exercise, the declining pulse pressure, and the increased pulse response insinuate a lower physical fitness in patients with adrenal insufficiency.