ABSTRACT

Certain aspects of adrenocortical function in health and disease have been studied by direct estimation of the concentration of 17-hydroxycorticosteroids in plasma.

The validity of the chemical method used has been investigated and established.

Plasma steroid levels in normal subjects have been determined, and diurnal variations and changes due to emotional disturbances found to occur.

In normal subjects the responses to ACTH given by intravenous infusion or by intramuscular injection in saline or a gelatin menstruum are compared. A maximum response is demonstrated and the effect of repeated ACTH administration studied.

The rate of absorption of cortisone acetate given by intramuscular injection is compared with that following oral administration and the route of absorption from the intestinal tract investigated.

Steroid levels have been studied in a number of conditions.

In pregnancy the plasma steroid level rises to a maximum at term, and after delivery falls to normal levels within a week.

In Addison's disease the steroid levels are zero to low normal and there is no adrenocortical response to ACTH

infusion. The concept of complete and relative adrenocortical insufficiency is discussed. In adrenocortical failure due to pituitary dysfunction plasma levels are low normal to zero: the response to intravenous ACTH is normal, similar to that found in Addisonian patients or midway between the two. In Cushing's syndrome high plasma steroid levels are found and the response to ACTH, when this syndrome is due to adrenocortical hyperplasia, is abnormally great. In some cases of myxoedema, there is evidence of hypocorticism. In congenital adrenal hyperplasia steroidogenesis is abnormal.

High steroid levels are found in patients who are distressed, in extremis or undergoing surgical operations. Salicylates, adrenaline and deep X-irradiation do not alter the plasma 17-hydroxycorticosteroid levels.

These findings are discussed and their significance and clinical application outlined.