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Function tests: determination of precision and criteria of response, and comparison between different tests.

Function tests are crucial in our diagnostics, but no adequate methods have been described for determining their precision and criteria, and for quantitative comparison between different tests. We have solved this dilemma. We repeated HPA axis tests in a group of subjects and analysed the inter- and intra-individual variation of different parameters of the responses. Log and per cent transformations were appropriate for adequate analysis. Per cent intra-pair difference (PIPD) of the parameter in the repeated tests proved to be the most useful measure of precision. The precision of a parameter is expressed as the SD of PIPDs in a group of subjects. The most precise parameter of ACTH test was the 2-h cortisol level (SD 8.1%), of insulin and vasopressin tests the highest level (10.6 and 11.7%), and of metyrapone test the 3-h deoxycortisol level (15.7%). For these, exact confidence limits were established for normal response and for significant change in response. The PIPD method even allows quantitative comparison between different tests. Relative to insulin responses, the vasopressin responses were increased in hypothalamic ACTH deficiency and decreased in isolated GH deficiency.

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Congenital adrenal hyperplasia:Simultaneous determination of aldosterone and 17hydroxyprogesterone

Plasma levels of aldosterone(PA) and 17hydroxyprogesterone(17-OHP), urinary pregnanetriol (PT), pregnanetriolone and 17-ketosteroids were determined in 19 children with CAH. 17-OHP in 5 cases before onset of therapy was at least 40 times above normal range, PA also being elevated. Well controlled patients had normal PA and 17-OHP below 5 ng/ml. Both steroids were well stimulable by ACTH. In 3 poorly controlled cases elevated PT and 17-OHP up to 131 ng/ml were found. Withdrawal of therapy resulted in pronounced rise in PA and 17-OHP. Additional exogeneous ACTH had no effect in 7 cases leading to further stimulation in the other children. Correlation between 17-OHP and PT was excellent ($r=0,84$, $p<0,003$) and fairly good between PA and 17-OHP ($r=0,65$, $p<0,01$). The data confirm the value of 17-OHP determinations for diagnosis and management of CAH on the one hand, and the compensatory elevated aldosterone production on the other.

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Effect of single small dose Somatostatin/GRIF/ on growth hormone release in children.

Twenty healthy children without any endocrine or metabolic disorders received 5 ug/kg bw. cyclic GRIF in single dose i.v. Saline infusion was given to five children using control. The serum GH content was measured in the first three hours after the injection. The lowest values were obtained in the fifth and the ninetieth minutes, the highest ones in the thirtieth, hundredfiftieth and hundred eightieth minutes. Eighteen of twenty GH reserve was demonstrable./ 5 ng/ml/The difference between the effect of GRIF and saline was significant. Rebound of GH is described after a single /bolus/ small dose GRIF in healthy children with a standardized radioimmunoassay method. The suppression of GH secretion with exogenous GRIF can start a contraregulation in the way of GRF and the struggle between endogenous GRF and GRIF resultes in a second GH peak.

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Serum 17OH-progesterone, serum cortisol and plasma ACTH in the management of congenital adrenal hyperplasia.

17OH-progesterone (RIA), cortisol (isotope derivative technique), and ACTH (RIA) was measured at control visits during 18 months in 24 patients with cortisone treated CAH (all 21OH-deficiency, 14 were salt losers). - Treatment was not changed in 14 patients (dosage reduced in 1). 17OH-progesterone was increased in 2, cortisol and ACTH was normal in all 14 patients. In 9 patients the dosage was raised at 20 occasions. Pregnanetriol excretion was increased in all 20 occasions and 17-KS in 16. Contemporary blood values were abnormal: 17OH-progesterone was high in 14 of 20 occasions, cortisol was low in 7, and ACTH high in 2. - Taken as new diagnostic tests compared to the excretion of 17-KS and pregnanetriol, the predictive value of a positive test (I) and the predictive value of a negative test (II) was:

		I	II			I	II
17OH-P	/17-KS	6/11	23/31	17OH-P	/Ptriol	7/11	23/30
Cortisol	/17-KS	4/6	25/27	Cortisol	/Ptriol	5/6	20/24
ACTH	/17-KS	1/1	17/23	ACTH	/Ptriol	1/1	15/23

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Serum somatomedin activity (SMact) in children with acute lymphoblastic leukaemia (ALL).

SMact estimated by the porcine bioassay at diagnosis in 24 children with ALL was low (mean 0.20 U/ml. ± 0.10). In all 15 subjects studied after completion of induction chemotherapy SMact rose (mean 0.54 U/ml. ± 0.21) and GH responses to insulin hypoglycaemia and arginine were normal. In 29 children in complete remission for 4-8 years mean SMact (0.65 U/ml. ± 0.23) and mean height velocity S.D. score (-0.17 ± 1.78) were normal. A subgroup (12 out of 29) who received a higher dose of cranial irradiation had impaired GH responses to insulin hypoglycaemia, but a normal mean SMact and a normal mean height velocity. However, one child in this subgroup with the lowest level of SMact (0.35 U/ml.) had clear biochemical and clinical GH deficiency. In ALL of childhood, bioassayable SMact is low at diagnosis, recovers after induction therapy and is normal in remission unless overt GH deficiency occurs.

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Endocrine function and growth retardation in Perthes' Disease.

Children with Perthes' disease are frequently small with bone age retardation. Eighteen boys aged 5-11 yrs have been studied who had a bone age 2 yrs behind their chronological age or who were below the 3rd centile in height. Their Se GH response (18.5 ± 8.6 mu/l) during insulin induced hypoglycaemia was significantly lower than the response of a control group of age matched boys with constitutional short stature (31.7 ± 9.7 mu/l) ($p= 0.01$). Se somatomedin (SM) values, measured by chick cartilage bioassay ($115\pm24.3\%$) were higher control values ($102.8\pm25.4\%$). Thyroid and adrenal function was normal. In control boys SM values showed a significant correlation with both chronological age and bone age but no correlation could be demonstrated in Perthes' boys.