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The lipogenetic effect in isolated rat fat cells of a serum fraction (m.wt. 1,000-5,000) of obese and non-obese children.

We have previously described islet-stimulating activity in a serum fraction of obese children (Pediat.Res 1976:10: 888). The activity occurs more often in the sera of younger than older children. The present study was done to find out whether the same fractions would also have a peripheral effect. Fasting blood specimens were obtained from obese and non-obese children in connection with blood sampling for clinical purposes. A serum fraction of m.wt. 1,000-5,000 (Fr) was obtained by molecular filtration. The Fr's were incubated with isolated rat fat cells and U-C^{14}-glucose in KRBA medium, and the incorporation of glucose into triglycerides was measured. Fr's causing at least a 25% stimulation as compared to maximal insulin stimulation in the same experiment were regarded as positive. Ten out of 13 obese children, aged 4-15 yr. had a positive Fr. Of the 18 non-obese children studied, five were newborns and had a positive Fr. Of the remaining 13 subjects, aged 10 mo.-13 yr., eight had a positive Fr. The Fr does not contain IRI, and the m.wt. excludes NSILA. The chemical nature and physiological significance of this lipogenetic activity, commonly found in sera of children remain to be studied.

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Mechanism of opiate-induced release of GH in the rat.

Morphine (M) is known to be a powerful releaser of both growth hormone (GH) and prolactin (PRL) in the rat. More recently, endogenous opiate peptides such as β-endorphin (E) have also been found to stimulate the release of both hormones. Although the mechanism of the release is unknown, it clearly involves the central nervous system (CNS). We have recently performed several experiments to verify whether CNS serotonergic pathways are implicated in such an effect. Pretreatment of rats with the serotonin (SER) depletor PCPA significantly enhanced GH release induced by M and by E, while PRL release was unaffected. The SER precursor 5-hydroxytryptophan antagonized M-induced GH release. However, acute treatment with E, or chronic treatment with M did not modify the activity of raphé nuclei tryptophan hydroxylase. The hypothalamic hormone TRH was capable of antagonizing M- and E- induced GH release through a CNS serotonergic pathway. It is suggested that opiates stimulate GH release by suppression of an inhibitory serotonergic tonus.

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Pituitary and thyroid function after Xray therapy for medulloblastoma.

Late endocrine effects of head and spine irradiation were studied in 33 children 2 yrs or more after treatment for medulloblastoma. Radiation doses estimated in restrospect were between 3500 rads and 4250 rads to the pituitary (lateral field on the skull) and 2400 rads in average to the thyroid (posterior field on the spine). Growth retardation was present in 21 cases (63%). GH deficiency with low plasma somatomedin activity was present in 18 patients (54%). However no deficit of TSH, ACTH and PRL was demonstrated. Posterior pituitary function was normal. Elevated basal or TRH stimulated TSH secretion was present in 15 patients, although only 3 had low T4 and/or T3. Preliminary results indicate improved growth with thyroid hormone treatment.

In conclusion, impaired GH secretion with otherwise normal anterior pituitary function and compensated hypothyroidism are frequent complications of head and neck irradiation.

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LHRH response and adrenal androgens in growth-hormone deficient boys with micropenis

Plasma concentrations of androstenedione(A) and dehydroepiandrosterone(DHEA) and plasma gonadotrophin response to 100μg LHRH were measured in 6 boys with idiopathic growth-hormone deficiency(GHD) and micropenis (Bone age (BA) mean:11.48, CA range:10.7-15.9), 6 boys with GHD and normal genitalia matched for BA (BA:11.27, CA:11.3-15.5) and 5 boys with idiopathic delayed puberty also matched for BA (BA:11.67, CA:12.6-15.1). The boys with micropenis had significantly lower LH ($P<.002$) and FSH ($P<.006$) responses to LHRH than the boys with normal genitalia; whether growth-hormone deficient or not. Plasma A and DHEA increased with BA in each group and did not differ significantly between groups. Micropenis is associated with gonadotrophin deficiency despite the occurrence of virilization in some cases, perhaps due to adrenal androgens.

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Effect of hormonal therapy on growth variables in hypopituitary patients followed up to final height.

The usefulness of growth variables for evaluation of therapy can best be appraised when final height is reached. 13 GH-deficient patients were treated with HGH for a mean duration of 5.7 yrs reaching a mean final height of 150.2 cm in 3 females and 160.4 cm in 10 males corresponding to a mean of -1.97 SD of their sex-corrected mid-parent height (target height). This final result did not correlate with height deficit and age at onset of therapy; a significant correlation, however, was found with bone age retardation (Spearman rank test, $p<0.01$). The index of potential height (SD of height related to bone age) varied only slightly under therapy. Of all currently used height prediction methods only Tanner's bone age-based equations (T_{BA}) mirrored extrapolated height if no treatment were given. HGH therapy increased height prediction T_{BA} by +25.2 cm (15.1-58.8) after 4 yrs of therapy. Addition of sex-hormones or spontaneous puberty similarly increased prediction T_{BA} by +3.8 cm after 2 yrs of therapy. This favours a well-timed initiation of puberty thus giving a chance for social integration.

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Serum testosterone concentration in prepubertal and pubertal female rats.

Serum testosterone concentration (S.T.) by radioimmunoassay and ovarian adrenal and uterine weights were evaluated in prepubertal (PP), aged 26-33 days and pubertal (P) aged 36-43 days, on day of autopsy, female rats. Only in P rats a significant positive correlation ($P<0.01$) between S.T. and ovarian weight was revealed. In P rats with minor signs of sexual maturation a highly significant decrease in S.T. ($P<0.001$) was noticed when compared to P rats of the same age with advanced sexual maturation and to PP rats. In both groups of P rats a significant fall ($P<0.005$) in relative adrenal weight in comparison with PP rats was apparent. It is suggested that the fall in S.T. and an adrenal ovarian interplay might be implicated in the process of sexual maturation.