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RENAL FRACTIONAL EXCRETION (FE) OF HUMAN GROWTH HORMONE (HGH) IS CORRELATED TO INULIN CLEARANCE (GFR) AND PROXIMAL TUBULAR FUNCTION. L.B.Zimmerhackl*, W.v. Petrykowski, M.Hentschel*, J.Girard[1], M.Brandis*. Depts. of Pediatrics, Universities Freiburg, Germany and Basel[1], Switzerland

Urinary HGH has been proposed to evaluate HGH secretion. Renal excretion of microproteins, including HGH, depend on GFR and proximal tubular reabsorption. In 15 children with various renal diseases HGH excretion was compared to inulin clearance (GFR) with a mean±SEM of 108±15 ml/min*1.73m^2 (range 22-238) and renal tubular function determined by albumin (ALB) and α_1-microglobulin (α_1-MG) excretion under standardized conditions (fasting, volume load 2% of body weight per h). HGH concentrations (n=44) were measured with two different antibodies by RIA, Nordisk and own (Girard) method. With both assays HGH was significantly correlated to ALB (mean±SEM: 628±342mg/l) with R of 0,50 (p<0.001, Nordisk) and R=0,41 (p<0.01, Girard), and α_1-MG (7.9±3.0 mg/l) with R=0,42 and R=0,52 (p<0.01 and p<0.001). FE of HGH was inversely correlated to GFR (R=0.61, p<0.001) but independant of urinary flow rate. **Conclusion:** To exclude disturbed renal handling urinary HGH concentrations should be evaluated in conjunction with albumin and α1-MG to establish glomerular and proximal tubular integrity.

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PUBERTAL GROWTH, ADULT HEIGHT (AH) AND TARGET HEIGHT (TH) IN 50 PATIENTS TREATED FOR ACUTE LYMPHOBLASTIC LEUKEMIA (ALL) - A LONGITUDINAL STUDY J.H. Brämswig, G. Zielinski, G. Schellong, H. Jürgens
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Several recent reports have indicated, that early puberty and impaired pubertal growth occur in patients treated for ALL. Rarely a long-term longitudinal follow-up has been reported including the adolescent growth-spurt, the AH and TH of patients treated with the same protocol.
50 patients are in 1st CCR after treatment for ALL with the BFM-70 and BFM-76-protocol. Puberty, pubertal growth and AH were evaluated, when peak height velocity (PHV) did not occur within the 1st year after therapy.
All patients received intensive induction chemotherapy and prophylactic cranial irradiation with 18 or 24 Gy. Maintenance chemotherapy consisted of daily purinethol and weekly methotrexate (BMF-76) or weekly methotrexate and cyclophosphamide (BFM-70) as well as three two week courses of prednisone and vincristine during the first year of therapy. The total duration of therapy was 2 1/2 (BFM-70) or 2 vs. 2 1/2 years (BFM 76).
Pubertal growth was documented at different time intervals during puberty including peak height velocity. PHV was 8.8 ± 2.1 cm in girls and 9.1 ± 0.5 cm in boys, comparing favourably with normal standards of 9.8 ± 1.2 cm in boys and 8.1 ± 1.2 cm in girls (Buckler, 1990). Normal growth was also noted for other pubertal periods i.e. menarche to AH, PHV to AH etc.. On the other hand the age of PHV was early in girls 10.7 ± 1.4 years vs 12.2 ± 1.0 years (controls) and normal in boys (13.6 ±10.3 vs 13.9 ± 0.8 years).
While growth was normal during puberty the mean height-SDS before, after therapy and AH indicated a continuous loss of height-SDS with 0.74, 0.23 and 0.18 SDS for the total group of boys and girls. In contrast, normal adult height was reached with 179.7 ± 6.4 cm (boys) and 163.5 ± 6.1 cm (girls) which was not different from TH (Tanner method) of 177.5 ± 4.5 cm and 163.2 ± 3.1 cm.
We conclude, that height-SDS for CA is a poor predictor of growth and AH, because it indicates a continuous loss of height potential. Since AH is normal and not different from TH, no major loss of height is present. Thus, TH is the most appropriate method in evaluating growth and estimating AH in patients treated for ALL.

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PREDICTED HEIGHT AND ADULT HEIGHT IN GIRLS WITH UNTREATED CONSTITUTIONAL TALL STATURE (CTS). A RETROSPECTIVE ANALYSIS OF THE TARGET HEIGHT (TH), BAYLEY-PINNEAU (BP), ROCHE-WAINER-THISSEN (RWT) AND TANNER-WHITEHOUSE (TW) METHODS OF HEIGHT PREDICTION. B. Oest, J. H. Brämswig, A. Busemann, G. Schellong, University Children's Hospital, D - 4400 Münster, Germany

Height predictions are performed in girls with CTS using various methods of height prediction (HP). Rarely, adult height (AH) and predicted height have been analysed in a larger group of untreated tall girls to evaluate the accuracy of each prediction method. Adult height was measured in 104 women previously seen for CTS. Bone age (BA) was reevaluated in all patients using the Greulich-Pyle (GP) and Tanner-Whitehouse TW2-RUS method of BA determination. CA and BA were not different by more than 1 year (GP-method). HP were performed according to the TH-, BP-, RWT- and TW-Mark I and TW-Mark II methods. In addition, HP were calculated for the TW methods with midparental height (MPH) of 172 cm and the age of menarche. CA at the initial visit was 12.9 ± 1.4 years (x ± SD), BA 13.2 ± 1.4 years (GP) and 14.0 ± 1.3 years (TW II-RUS). AH was 179.8 ± 3.8 cm. 114 height predictions were performed at different SA groups starting at 10 years.
The BP-method was the only method overestimating AH by 0.5 ± 2.7 cm (total group). All other methods underestimated AH (RWT - 1.8 ± 2.3 cm, TW-Mark I -2.7 ± 2.6 cm, TW-Mark II -1.7 ± 2.5 cm). No major improvement was noted, when MPH or age of menarche were included. TH underestimated AH by -6.5 ± 4.3 cm. 8 patients with an AH of 178.7 cm had two HP performed at a mean CA of 11.5 and 13.1 years. Mean HP were almost identical with 178.4 cm vs 178.3 cm (BP) and 177.7 cm vs 176.1 cm (TW-Mark II).
We conclude, fairly accurate results were obtained für the total group of tall girls with almost all height predictions. Repeated HP, performed in a small number of patients, did not improve the accuracy of the method. With AH being much taller than TH the height gain in tall girls obviously exceeds the magnitude of the average secular growth change.

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IGF-1, IGF BINDING PROTEIN-3 AND PROCOLLAGEN I AND III IN ASTHMATIC CHILDREN TREATED WITH LOW DOSES OF PREDNISOLONE.
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Little is known about the mechanisms of the growth inhibiting effect og exogeneous glucocorticosteroids. The aim of the present study was to assesss whether low doses of oral prednisolone affect serum levels of IGF-1, IGF binding protein-3, the carboxyterminal propeptide of type I procollagen (PICP) and the aminoterminal propeptide of type III procollagen (PIIINP). A group of 10 children with asthma aged 7-11 years was studied. The design was a randomised double-blind cross-over trial with run-in, wash-out and two active periods of 15 days. During run-in and wash-out placebo was given. During active treatment periods 2.5 or 5 mg prednisolone were given per day. Blood samples were taken at the end of the periods.
IGF-1 and IGFBP-3 were not statistically significantly influenced by the treatments. PICP (ng/ml) was 345 (run-in), 319 (2.5 mg) and 275 (5 mg); Pages test:P<0.05. PIIINP (ng/ml) was 7.84 (run-in), 5.96 (2.5 mg) and 4.69 (5.0 mg); Pages test:P<0.01. Oral prednisolone causes a dose related reduction of procollagen I and III indicating a suppression of collagen synthesis. This may explain the growth retarding effect of systemic glucocorticosteroids.

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GROWTH HORMONE THERAPY OF CHILDREN WITH DOWN SYNDROME RESULTS IN NORMALIZED GROWTH VELOCITY
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Growth velocity is markedly reduced in children with Down syndrome (DS) between 6 months and 3 years of age, but is almost normal after 3 years of age. Thus, the growth retardation becomes pronounced during the period when growth hormone (GH) starts to stimulate growth. We report the long term effects of GH-therapy in 16 children with DS. Treatment with Genotropin, 0.1 U/kg BW/day was started at a mean age of 7.4 (6-9) months. The results after 12 (n=16), 24 (n=14) and 30 (n=10) months are presented. The mean height standard deviation score (Swedish standard) before therapy was -1.8 and the mean head circumference was -1.2. After 12, 24 and 30 months the mean height SDS were -1.1, -0.9 and -0.9 and the mean head circumference SDS were -1.1, -1.1 and -1.2, respectively.
Conclusion: During GH-treatment the children with DS did not deviate further from the Swedish growth standard. As compared to growth charts for children with DS (Pediatrics 81:102, 1988) the mean height started at the 50th centile and reached the 90th centile after 24 months of treatment. The head circumference was not affected by the therapy.

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CARDIAC MRI IN R-HGH TREATED CHILDREN. P.Amendt, K.-D. Sandring and S.Gellert, Childrens Hospital and Institute for Diagnostic Radiology, Humboldt-University (Charite'), O-1040 Berlin, Germany

To evaluate side effects of a human growth hormone therapy (r-hGH) we performed standard ECG-gated MRI (multiple slice echo sequence, 1.5 T). We investigated 12 girls with Turner's syndrome (TS, chronological age 3.5 to 19.1 years, r-hGH dosis 13-24 IU/m^2/week, period of treatment 24 to 36 months) and 14 children (normotonic) with chronic renal failure (CRF, chron. age 4.1 to 16.6 years, r-hGH dosis 23-32 IU/m^2/w, treatment period 3 to 11 months). There were no pathological findings in the group of TS patients whereas in 3 of 14 cases suffering from CRF we have seen circumscriptal thickness of the central and basal part of the septum of the heart without any evidence of left ventricular hypertrophy. The signal intensity of these suspected areas were identical to normal myocardium. These abnormalities were found to be unchanged (e.g. without any progression) under further treatment of 6 months. Although the etiology of this regional myocardial hypertrophy of the intraventricular septum of the heart is still unknown, such myocardial changes may be related to metabolic disturbances in uremic children and/or to the higher r-hGH dosis used in the group of CRF in comparison to TS.