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M.Klett⁺, P.Mayer⁺ and D.Schönberg, Zentrum für Kinderheilkunde, Abteilung für pädiatrische Endokrinologie, Universität Heidelberg, GFR Neonatal thyroid function in fullterm, small-for-gestational-age and premature newborns.

A two-year experience in screening for congenital hypothyroidism has shown new problems concerning evaluation of borderline values especially in prematures. In order to elucidate neonatal thyroid status we examined TSH, T₄, T₃, reverse T₃ (rT₃) and TBG in 80 full-term (FT), 20 small-for-gestational-age (SGA) and 70 premature (P) newborns. Approved by our local ethical committee, blood was drawn together with clinically indicated blood examinations between 5th and 30th day of life. **RESULTS:** TSH (2,9 uU/ml) did not differ from FT in SGA and P. T₄, T₃, rT₃ and TBG-levels rose with gestational age: T₄ 89-120 ng/ml; T₃ 1,4-1,7 ng/ml; rT₃ 0,54 - 1,38 ng/ml; TBG 23,7-27,3 mg/l. FT-values were reached by P at a "gestational" age of 40-42 weeks. There is no difference between SGA and FT. **CONCLUSION:** Relatively low TBG-levels and a supposed immaturity of thyroid gland seem to account for lowered peripheral thyroid hormones in P. This assumption is supported by the absence of TSH-stimulation of thyroid gland development in P in spite of low circulating thyroid hormones.

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Screening for neonatal hypothyroidism using both T₄ and TSH spot assay.

In an Israeli nationwide screening program for neonatal hypothyroidism using blood spots on filter paper 42071 newborns were screened. The screening program detected 10 infants - an incidence of almost 1:4000. 9 infants had primary hypothyroidism and 1 secondary hypothyroidism. The 4 last newborns were detected by thyroxine and confirmed by thyrotropin radioimmunoassay using the same original filter paper blood spots. Another 5 infants were diagnosed as thyroid-binding globulin deficient. In 3 infants reverse T₃ was measured in serum taken at the day of the filter paper spotting: in 1 infant the levels were high and in 2 low. In 2 infants born to mothers suffering from thyroid disease, a transient state of hypothyroidism was diagnosed. Whereas serum reverse T₃ estimation did not seem helpful in neonatal screening of hypothyroidism, the T₄ and TSH spot assay combined system reduced the number of infants to be recalled.

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Childhood hyperthyroidism: results of treatment, and studies of gastric mucosa.

40 hyperthyroid children were followed for 0.2-12 (mean 4.5) years. The treatment was antithyroid drugs in 20 (Group I), thyroidectomy after a drug trial in 18 (IIa), and primary thyroidectomy in 2 (IIb). 4 patients relapsed after surgery and were given radioiodide. Half of the operated glands were nodular. At the follow-up study, of Groups I and II, 17 and 7 patients were euthyroid, none and 12 hypothyroid, and 2 on continuing medication and 1 relapsed, respectively. 3 and 2 of the euthyroid patients had decreased thyroid reserve. The gastric mucosa was abnormal in 7 of the 27 patients who were studied. 2 were achlorhydric and 12 had parietal cell antibodies. Circulating antibodies against thyroid microsomes were present in 31 of 34 patients. Evidently, follow-up is needed because of the immunological abnormalities.

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Serum a₁-fetoprotein levels in congenital hypothyroidism.

Serum a₁-fetoprotein (A.F.P.) was measured by double antibody radioimmunoassay in 4 boys and 5 girls with congenital hypothyroidism aged 1 to 3 months and in 20 normal infants matched for age and sex. Thirty days following the initiation of thyroxine substitution therapy which was instituted upon diagnosis (A.F.P.) was remeasured. Serum A.F.P. in the hypothyroid infants was found to be raised before therapy (147.6±20.7 ng/ml) compared to normal infants (28±7.26 ng/ml). This difference was highly significant (p < 0.001). After one month therapy with thyroxin there was a significant fall in A.F.P. levels (51±19.7 ng/ml). It is suggested that if elevated AFP levels are found during A.F.P. screening programmes hypothyroidism should be excluded.

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Institute, Warsaw, Poland, Goitre and hypothyroidism in children and adolescents during long-term anticonvulsive therapy.

Among children and adolescents with goitre we observed a group of 32 epileptic patients on long-term therapy with Phenydantoin-Amizepin and Mizodin-Polfa in different combinations. In about 50% of patients total T₄ was below the lower limit of normals but the corresponding T₃ uptake was normal except 4 values in hypothyroid range. Total T₃ was usually in normal range. Only in one case it was clearly elevated. Serum TSH was in 11 patients moderately elevated and in 3 others was very high. After introduction of substitution therapy with low doses of thyreoideum-Polfa/thyroidea sicca/we observed a brisk normalisation of T₄, T₃ and TSH levels. It is to stress out, that the long term antiepileptic therapy may cause in children and adolescents onset of goitre and subclinical hypothyroidism.

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Androgen Receptors and Metabolism in the Human Fetus

Previous studies in this laboratory have shown that human cultured skin fibroblasts have a receptor which binds dihydrotestosterone (DHT) with high affinity, high specificity but low capacity. K_d and B_{max} values were similar in sex skin fibroblasts from male and female subjects but the B_{max} of sex skin was higher than in non-sex skin. The present investigation was designed to find out whether fetal cells have DHT receptors, the age they can be detected and whether there are differences in B_{max} between fibroblasts from sexual organs and non-sexual tissues. 1/ The youngest specimen studied was 8 wks: DHT receptors were found in fibroblasts from non-sex skin. 2/ A 10 wk fetus had a high level of DHT receptors in fibroblasts from the external genitalia. The value was similar to normal values for newborn skin. 3/ In 2 female fetuses there was greater DHT binding in fibroblasts from sex organ than in those from non-sexual skin. 4/ DHT receptors were present in fibroblasts from testis, from lung but not from intestine. 5/ In a mixture of epithelial cells and fibroblasts from one kidney, we found receptors with a low B_{max} and a low K_d. 6/ 5α-reductase activity was detected in fibroblasts of a 10 wk old fetus; the levels being lower in non-sex skin than in sex organs.