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IODINE IN CONTRAST AGENTS AND SKIN DISINFECTANTS IS THE MAJOR CAUSE OF HYPOTHYROIDISM IN PREMATURE INFANTS DURING INTENSIVE CARE

Unexpectedly, the administration of only 1 ml radiopaque dye and a single skin disinfection with PVP-iodine (PVP-I) induced clinical hypothyroidism in a premature newborn. Therefore, we studied the impact of two different, non-ionic, iodine containing contrast agents (administered for diagnostic reasons), Amipaque (1) and Omnipaque (2), and of PVP-I alone (3) on the immature thyroid gland by measuring TSH, T4, T3 and I excretion before, 5 and 14 days (TSH 0,5,14, resp.) after I-exposure. Rarely infants of group 1 and 2 received single doses of PVP-I. The content of free iodide is higher in the solubilized contrast agent (Omnipaque). TSH values(µU/ml) are shown below (medians):

group	Gest.Age (weeks)		n	TSH 0	TSH 5	TSH 14
1	39	(37-40)	17	1.9	2.5	2.8
2	31	(25-40)	9	5.0	88.0	113.0
3	35	(28-41)	19	5.0	15.0	60.0

Total iodine excretion was excessively increased in all groups. In group 1, T4 and T3 levels were in the lower normal range and only 1 case of transient hyperthyrotropinemia was observed. In groups 2 and 3 T4 and T3 values were very low; we diagnosed hypothyroidism in 90 % of preterm and in 30 % of term infants and treated 8 in whom hypothyroidism persisted for > 14 days.
Conclusion: Prematurity and iodide content are responsible for the occurrence of transient hypothyroidism in infants in intensive care.

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TRANSIENT AND PERMANENT CONGENITAL HYPOTHYROIDISM AND MATERNAL ATROPHIC THYROIDITIS

Cases of familial transient hypothyroidism born to mothers with atrophic thyroiditis have been described, although a regular coincidence of neonatal hypothyroidism and maternal thyroid antibodies(AB) has been disproved by a systematic study in newborns.
RESULTS: This is a case report of a mother who passed an atrophic thyroiditis during childhood at the age of 15 years. She has been treated with l-T4 since then. Between age 18 and 25 she had born three offsprings. The first-born was a male, suffering from permanent neonatal hypothyroidism. The second- and third-born offsprings were females. Both of them had a clear transient hypothyroidism and were treated with l-T4 for one resp. two years. Maternal microsomal and thyroglobulin ABs were present at all three pregnancies, whereas in the offsprings thyroid AB titers disappeared within the first 6 months of life.
CONCLUSION: The results indicate, that atrophic thyroiditis of the mother can cause familial congenital hypothyroidism of different severity. This effect may be mediated by placental transfer of maternal cytotoxic immunoglobulins. The degree of thyroidal damage seems to be dependent from the time interval between maternal thyroid disorder and time of birth.

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THYROID INFILTRATING CELLS IN JUVENILE AUTOIMMUNE THYROIDITIS (JAIT).

Thyroid infiltrating cells in 12 patients with JAIT were analyzed. The mean age of the children was 13.6±1.7 years. Three of the patients were hypothyroid and two had elevated levels of TSH in serum. Eight had high titres of thyroid antibodies. About 86% of the thyroid infiltrating cells were lymphocytes, 4% lymphoid blasts, 6% neutrophils and 3% monocytes. The percent distribution of lymphoid cells in thyroid (and blood) was: T cells 61.1±11.3% (55.5±10.7%), T helper cells (T_h) 50.8±12.4% (34.1±10.8%), T suppressor cells (T_s) 24.4±6.1% (28.7±6.9%), B cells 24.5±10.7% (8.4±5.7%) and NK cells 13.0±4.8% (8.3±3.7%). 48% of the lymphoid cells in thyroid and 13% in peripheral blood expressed Ia (HLA-D coded structures). 80% of the thyroid epithelial cells also expressed Ia. T_h/T_s ratio was 2.2 in thyroid and 1.2 in blood.
The relationship between T_h, T_s and Ia expressing cells and clinical, biochemical and serological findings will be discussed.

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THYROTROPIN BINDING PROTEINS IN MYCOPLASMA. SERUM ANTIBODIES DIRECTED AGAINST A SPECIFIC MYCOPLASMA MEMBRANE DETERMINANT IN PATIENTS WITH AUTO-IMMUNE THYROID DISEASE.

We attempted to determine whether Mycoplasma (MYC), an agent with known immunologic sequelae, possessed TSH binding sites and to ascertain whether these TSH receptor antibodies might cross-react with determinants in MYC. 125 I-bTSH bound specifically to several MYC species with apparent dissociation constants of about 10^{-7}M and maximal binding capacities of about 10^{-8}M. Unlabelled TSH, but not hGH, FSH, LH or prolactin caused 125 I-bTSH displacement. All 18 serum samples from Graves' disease patients contained antibodies directed against M.gallisepticum. 3 out of 6 serum samples contained antibodies directed against a 108 Kd determinant in M.gallisepticum. Serum from animals injected with MYC membranes, bound to thyroid membranes. Serum from one animal also bound specifically TSH by Elisa. This binding was displaced by TSH but not by HCG. Furthermore, serum from a rabbit injected by MYC had TBII (27%) post injection. Our data indicate that TSH binds specifically and with high affinity to MYC. Further studies are required to investigate the potential role of bacterial TSH binding proteins in the modulation of autoimmune thyroid disease.

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ALPHA-FETOPROTEIN (αFP) SERUM LEVELS IN CONGENITAL HYPOTHYROIDISM (CH): THIS BIOCHEMICAL INDEX OF FETAL MATURITY CAN DISCRIMINATE BETWEEN AGENESIS AND ECTOPIA.

Early diagnosis and treatment of CH have improved the neurological prognosis. Nevertheless it is strictly related to the entity of hormonal deprivation during the fetal life, too. We have measured αFP serum levels in 13 CH children at diagnosis (age 27.1±3.6 days), then after 15 days, 3 and 6 months from the beginning of $L\text{-}T_4$ replacement therapy. Three groups of healthy children, age matched, were used as controls.
αFP serum levels (ng/ml) are shown in the following table (mean±SE):

	A (diagnosis)	B (15 days)	C (3 months)	D (6 months)
CH patients	127723 ± 98707	14987 ± 11094	139 ± 51	52.3 ± 21.6
Controls	319.5 ± 52.1		71.5 ± 19.4	28.7 ± 8.3

αFP concentrations in all CH patients are extremely high at diagnosis as well as after 15 days of replacement therapy. They significantly decrease in further observations, with full normalization within 6 months. Moreover αFP levels in patients with thyroid agenesis are significantly higher than in patients with ectopia,at diagnosis.In conclusion αFP serum levels are useful in hypothyroidism and can differentiate agenesis from ectopia, since the concentrations in these two groups of patients are extremely different, without overlap at all. Since αFP is an indicator of fetal maturity it shows that fetal development is more impaired in agenesis than in ectopia, indicating a different thyroid hormones availability during the fetal life.

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THYROXINE (T_4) AND INTESTINAL FUNCTION: AN ANIMAL MODEL SYSTEM TO STUDY THE PATHOGENESIS OF CONSTIPATION (C) IN HYPOTHYROIDISM (H).

Although gastrointestinal motility(GIM) is held to be responsible for C/diarrhea in altered thyroid states, the actual mechanism is unknown. The aim of our study was to see whether C in H is due to GIM or electrolyte-water mucosal fluxes.

Adult rats were divided into 3 groups (G-1,2,3) and either untreated(G-1;n=5), treated with tapazole+T_4 (G-2;n=6) or with tapazole alone (G-3;n=6) for 4wks. Intestinal transit time(ITT) was determined by noting the time required to pass carmin-red in feces. Transepithelial bidirectional fluxes of Na, Cl and HCO_3 were determined across ileal mucosa mounted in Ussing chambers.

Serum T_4 in G-1 (5.0±1.3µg/dl;mean±sd) and G-2 (5.2±2.2) did not differ but both differed from G-3 (2.7±0.5;p<0.001). ITT was similar in the euthyroid (G-1,2;623±38min) and hypothyroid (G-3; 615±49) groups. Net ileal Cl flux (absorption"+"; secretion"-") did not differ between G-1 (-1.2±2.4mEq/cm²hr) and G-2 (-.2±1.6) but both differed from G-3 (+3.1±1.3; p<0.001). T_4 correlated with Cl-absorption (r=-.61; p<0.025), not with Na-fluxes. Cl-absorption correlated only with HCO_3 secretion (r=.65; p<0.005).

Our results suggest that the C of H is not necessarily due to GIM, rather to Na-independent Cl-absorption in exchange for HCO_3.