Abstracts

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1 S.H. LaFRANCHI, W.H. MURPHEY,* C.E. HANNA* AND N.R.M. BUIST.* Department of Pediatrics, University of Oregon and the Oregon State Public Health Laboratory, Portland, Oregon, U.S.A. Congenital hypothyroidism detected by a screening program with specimen collection at two time periods.

The Northwest (U.S.) Regional Screening Program (NWRSP) for congenital hypothyroidism (CH) employs a primary T_4 screen with TSH backup. Heel prick filter paper specimens are routinely collected at 2 time periods: days 1-7 of life and 2-6 weeks of age. Between 5/75 and 3/81, 470,750 infants were tested on the first specimen, while 266,200 were tested on the second specimen. 101 infants were detected with primary hypothyroidism (1:4660), 2 infants had hypopituitary hypothyroidism, while 78 infants were detected with congenital TBG deficiency (1:6035). Of the 101 infants, 90 were detected with a low T_4 and elevated TSH on the first specimen (1:5,230), while 11 infants were discovered with a low T_4 and high TSH on the second routine specimen (1:24,200). Of these 11 infants, 7 had a T_4 concentration above the 3% cutoff on the initial specimen while the other 4 had a T_4 below the cutoff, but their TSH concentrations were below the level of sensitivity of the TSH assay (usually <25 μU/ml). Tc99m scans done in 9 of 11 infants showed some residual thyroid tissue in 8 of 9 cases. Six of 7 infants had normal skeletal maturation on X-ray studies. We conclude that 10% of infants with CH appear to have an evolving hypothyroidism which is detected only by a second routine screening test at 2-6 weeks of age. The frequency of detection of CH on the second routine specimen has proven cost-effective in the NWRSP.

2 P ROCHICCIOLI, JP FARRIAUX*, ML BRIARD*, R BOSCHETTI* CHU Rangueil Toulouse France. Neonatal screening of hypothyroidism in France, Results of screening : 1.300.000 infants.

The neonatal screening of hypothyroidism started in France in 1975 in a few districts, then progressively extented to the whole country In 1980 the testing rate is 96.9%. 1.324.000 infants have been tested and 320 hypothyroidism detected. The incidence is 1/3200. Thyroid scanner (Tc 99 or I 123) revealed ectopia in 54%, athyreosis in 30% and gland in normal place in 16%. TSH levels are above 100 μU/ml in most cases. The control of T4 was made in 167 cases. T4 levels is 1,27±0,8 μg/dl in athyreosis and 3,9±2,6 in ectopia ($p < 0,001$). In 23 ectopia the T4 levels is normal, above 5μg/dl. A study of clinical score and bone maturation took place in 188 hypothyroidism. The clinical score is 2,9±1 in athyreosis and 1,7±1,2 in ectopia ($p < 0,001$). We found a correlation between clinical score, T4 levels and T3 levels ($p < 0,02$). The epiphysis area (Knee) is 6,4 ± 10 mm2 in athyreosis and 20,6±11 in ectopia ($p < 0,001$). There is a correlation between epiphysis area, clinical score, T4 levels and T3 levels ($p<0,05$). Psycho-motor development (Brunet-Lezine Test), with a 3 years survey, was only studied in 30 hypothyroidism followed in Midi-Pyrénées district. The global QD is respectivaly 101±9, 96±8 and 99±10 at the age of 6, 18 and 36 months. Partial QD are normal at 6 months but langage and sociability drop at 88±12 at 30 months, and a difference is found between athyreosis and ectopia for all partial QD at this age. These results allow us to find the differences known between ectopia and athyreosis in spite on early treatment.

3 E.EGGERMONT*,M.VANDERSCHUEREN,E.SMEETS*,G.VANACKER* J.JAEKEN*,H.DEVLIEGER*,PH.DE NAYER* and C.BECKERS.* Departments of Paediatrics and of Médecine Nucléaire, Universities of Leuven and Louvain, BELGIUM.

Transitory "euthyroid sick syndrome"in pre-term infants of fetal age ≤ 31 weeks.

Serum T4,FT4, T3, rT3, TSH,Tg, and TBG were measured by RIA in 37 pre-term infants of postmenstrual age ≤ 31 weeks.Blood was withdrawn at day 0 and 10,20,30 and 40 days after birth.From day 10 on,17 infants were treated with either T3 (5 μg/kg.day) or T4 (10 μg/kg.day) because of failure to thrive. The 25th,50th and 75th centile values were calculated and compared with those obtained in 20 well thriving infants. In the control group,T3 (ng/dl) at birth is low (45-81-108) increasing to (119-155-187) while rT3 (ng/dl) falls from (170-192-225) to (60-98-123).The 50th centiles of T4,FT4 and TBG remain rather stable throughout the study around birth levels at 4-5 μg I/dl,1.5 ng/dl and 2 mg/dl respectively.Patients have significantly lower levels of T4,FT4, T3 and TBG at birth and at day 10;Tg is significantly lower at birth; rT3 at day 10. T3 treatment results in increased levels of T3 and TBG and lowered T4,FT4 and rT3.T4 treatment is associated with low TBG and T3 levels despite normal levels of T4, FT4 and rT3. No significant differences in TSH levels are found. These data suggest that in some pre-term infants an "euthyroid sick syndrome" might exist for some time after birth; thyroid hormone therapy might counteract failure to thrive.

4 B. WOLF*, P. CZERNICHOW, N. ETLING*, R. POMAREDE*, R. RAPPAPORT. Hôpital des Enfants-Malades, Paris. 24h variation of T4, FT4, T3 and TSH after a single oral dose of l-T4 in congenital hypothyroidism.

Knowledge of plasma variation of thyroid parameters is important for blood sampling during evaluation of l-T4 treatment. 11 children, aged 2 to 12 months, treated with a single oral dose of l-T4 at 8 am (5 to 8 μg/kg) were studied for 24h. TSH was expressed as % of basal 8 am values (m ± SD).

	0	+ 2h	+ 4h	+ 6h	+ 8h	+ 24h
T4 μg/dl	8 ± 2.15	8.8 ± 2.0	8.8 ± 2.5	8.7 ± 2.6	8.5 ± 2.4	8.35 ± 2.9
T3 ng/dl	231 ± 36	233 ± 45	207 ± 36	200 ± 27	210 ± 31	229 ± 30
TSH % basal	100	80.5 ± 16.6	74.7 ± 16.4	62.3 ± 16.3	73.3 ± 25.6	81.3 ± 17.4

No significant variation was observed for plasma T4 or T3. A significant plasma TSH decrease was shown 4 to 8h after drug administration. Preliminary data on serum FT4 indicate a significant increase at + 2 and + 4h (n = 6).

In conclusion : due to lack of plasma T4 variations, there is no special timing for plasma sampling and T4 determination. The transient TSH decrease may underestimate plasma value if blood is taken 4 to 8h after medication. This may be due to FT4 elevation related to l-T4 absorption.