I. Thyroid and Parathyroid

130 EVALUATION OF "PAIRED TSH ASSAY" AS A SCREENING TEST FOR DETECTING CONGENITAL HYPOTHYROIDISM. K.Miyai; H.Mizuta; K.Ichihara; N.Aino; K.Nakatani; O.Nomé; T.Harada; T.Oura; T.Tsuruhara; K.Matsukura and M.Kawashima. Central Laboratory for Clinical Investigation, Department of Pediatrics, Osaka University Medical School; Osaka City Children's Hospital; Kanoko-Hoken-Kyokai and Osaka Kessei Laboratories. Osaka.

A new paired TSH assay method was developed and evaluated for mass screening of congenital hypothyroidism. In a first assay, equal parts of the extracts of dried blood spots on filter paper (9mm diameter) from two infants 4-7 days old are combined and assayed for TSH by a sensitive two step double antibody radioimmunoassay. If the value obtained is over the cut off point (4 percentile in the latest system C), the remaining extracts are assayed separately for TSH in a second assay to identify the abnormal sample with over 4 percentile. Theoretical analysis by computer and a model experiment indicate that congenital hypothyroidism with high TSH over 3 S.D. can be clearly differentiated from low values. From November 1975 to March 1978, a total of 113,890 babies from a general population were screened, 102 subjects (1/1,100, 1/544 in C) were recalled, 15 cases (1/7,600, 4/4,150 in C) with congenital hypothyroidism and 8 cases with "transient infantile hyperthyrotropinemia" were found. The method is valuable to save labor and expense.

131 THYROIDIN AS A PRIMARY INDEX IN MASS SCREENING PROGRAM FOR NEONATAL HYPOTHYROIDISM. K.Sato; T.Saito; Y.Yajima and Y.Takeya. The Tokyo Metropolitan Institute of Medical Science. Tokyo.

In order to evaluate the significance of thyroxin(T4) in dried blood spot for the mass screening of neonatal hypothyroidism, the T4 in filter paper disc was assayed as the following 3 kits. Concept-4 system (A: Micromedic) assays T4 in dried blood 3mm disc using antibody coated tube in automatic machine. In Thyroscan kit (B: Abbott) 6mm disc was used and B/T separation was done by polyethylene glycol method. In Gamma Coat (C: Travenol) 6mm disc was used in antibody coated tube. The sensitivity of Concept-4 was 1.0 μg/dl. The coefficient of variance of between assay ranged 0.5 to 8.1%, B:10.1 to 16.7% and C: 16.2 to 17.4%, respectively. The maximum number of samples assayed by each of kits were: A:600, B:282 and C:400 (samples per day by oneself). Considering these values main screening procedures were performed using Concept-4 system. After assaying T4 in all samples, 18% of the disc colors which were the same as T3 level were assayed for TSH. Using this system 2 cases of primary hypothyroidism, 2 cases of transient hypothyroidism and 6 cases of TSH deficiency were found out of 13,047 samples. T4 in dried blood spot may be useful: (1) to concentrate the doubtful group out of all samples, (2) to confirm the case after TSH screening and (3) to check the appropriateness of T4 treatment in hypothyroid patient.

132 A RADIOIMMUNOASSAY FOR MEASUREMENT OF 3,3'-L-DIODOOTHYRONINE AND ITS CLINICAL APPLICATION. T.Nogimori and T.Mitsuma. 4th Department of Internal Medicine Aichi Medical University, Aichi.

A sensitive, specific and reproducible radioimmunoassay for measurement of 3,3'-L-diodothyronine(T2) in unextracted human serum is described. The binding antiserum was prepared by immunization of rabbits with T2-bovine serum albumin conjugate. The antiserum did not crossreacted significantly with various thyroid hormone derivatives. Assay sensitivity was considered to be 0.5ng/dl by statistical criteria. The mean recovery was 101%. Intraassay reproducibility averaged and interassay variation were 4.0% and 6.0% respectively. 8-anilino-1-naphthalene sulfonic acid(200ug/tube) was used to inhibit binding of T2 to serum protein. The mean(Mean±SD) serum T2 concentration was 6.3±3.3ng/dl in normal subjects, 3.1±1.8ng/dl in hyperthyroidism, 3.2±2.5ng/dl in hypothyroidism. T2 levels in serum were decreased to normal range in patients with hyperthyroidism during antithyroid drug treatment. T2 levels in serum were increased to normal range in patients with hypothyroidism during thyroxine treatment. T2 levels were low in myocardial infarction, gastric ulcer and acute hepatitis and anoxia nervosa. The changes in serum T2 levels before and after hemodialysis in patients with renal failure did not show the same trend. These data suggest that this assay system renders attractive for clinical determination of T2.

133 RADIOIMMUNOASSAY OF URINARY IMMUNO-REACTIVE TRIIODOTHYRONINE(T-3) AND THYROIDIN(T-4). Shiro Noguchi, Katsue Usui, Y Uchi. Thyroid Clinic and Hospital, Beppu.

The measurement of thyroid hormones and their metabolites in urine might be useful in the study of thyroid hormone metabolism. A radioimmunoassay method for urinary T-3 and T-4 was developed. Portions of urine were mixed with thyroid hormone-free sera, specific antibody and labelled T-3 or T-4, and incubated for 2 hours at room temperature, then PEG was added for separating free from bound hormone. The recovery rates of T-3 and T-4 were 101% and 94% respectively. Hematuria had no effect to the measurement but proteinuria gave slightly higher values in 2 of 16 nephropathy patients. With untreated hyperthyroid disease the average urinary T-3 in normal subjects and Graves disease were 1.0±0.2μg/day and 4.3±1.8μg/day respectively. In normal subjects T-3/creatinine ratio was strikingly consistent in each individual and no circadian variation was found. In Graves disease, the ratio can vary widely up to 5 folds without rhythmic pattern. Urinary T-4/creatinine ratio in normal subjects, contrasted to more than 800ml in normal subjects, 24-hour urinary T-3/serum T-3 ratio was less than 800ml in normal subjects, contrasting to more than 900ml in Graves disease, indicating a higher clearance rate of T-3 in hyperthyroidism.