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IN VITRO ASSAY FOR THYROID STIMULATORS USING CULTURED HUMAN THYROID CELLS. K.Kasagi,Y. Iida,K.Ikekubo,J.Konishi,K.Torizuka,K.Kuma and T.Mori. Dep. of Nuclear Medicine, Kyoto Univ. School of Medicine, Kuma Hospital and Kobe Central City Hospital. Kyoto and Kobe.

An assay for thyroid stimulator using human thyroid adenoma cells in monolayer culture was developed. The cultured cells were incubated in 0.3ml of Hanks solution or modified medium, pH 7.5, containing 1.5% BSA, 20mM HEPES, 0.5mM 3-isobutyl-1-methylxanthine and thyroid stimulator at 37°C for 2 hours. Incubation was ended by adding 0.3ml of 10% TCA and cAMP concentration was measured by radioimmunoassay. Relative cAMP responsiveness to bovine TSH or several IgGs (3mg) from patients with Graves' disease (HTS) was investigated using three kinds of media (A:Hanks, B:Hanks containing 5% glucose instead of 0.8% NaCl, C:Hanks without NaCl). The use of medium B or C resulted in much greater increase of cAMP response to HTS than to TSH as comapred with medium A. Furhter, the assay using medium C was the most sensitive with 4-6 times increase in cAMP at the concentration of 10μU TSH/ml. Using medium C, HTS was detected in 26 (74.3 %) of 35 patients with untreated Graves' disease. Biological activities of acetone-extracted TSH from human sera (Expressed as cAMP generated/dish/hour) showed good correlation ($r=0.955$, $n=18$, $p<0.001$) with serum TSH concentrations measured by radioimmunoassay in normal subjects and patients with primary hypothyroidism.

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STUDIES ON EFFECT OF IODINE RESTRICTION ON THYROIDAL- ^{131}I-UPTAKE. S.Wanibe,F.Kasahara, T.Sano and N.Nihei. Internal Medicine and Radiology,Tokoname City Hospital and IIIrd Internal Medicine,Hamamatsu University. Tokoname and Hamamatsu.

The possibility to minimize the duration of iodine restriction on thyroidal- ^{131}I-uptake (UPTAKE) was investigated.
11 normal subjects (N), 16 hyperthyroidism (R), 21 chronic thyroiditis (C), 5 nontoxic diffuse goiter (A) and 2 subacute thyroiditis (S) were fed on low iodine diet (KI:250~400μg/day) for two weeks. UPTAKE at 3 and 24 hrs. were determined on 6, 7th day (Ist test) and 13, 14th day (II nd test). UPTAKES at 3 and 24 hrs. in Ist and II nd tests were (N) 12.4±1.4(M±SE), 26.4±2.3: 12.1±1.2, 25.5±2.5%D, (R) 60.5±6.4, 76.2± 4.1:56.4±6.4, 72.1±4.1%D, (C) 20.5±2.7, 35.6±3.8:21.8±3.1, 36.5±4.0%D, (A) 10.8±0.7, 19.4±1.4:10.9±1.1, 21.0±1.9%D, (S) 3.8±0.3, 0.6±0.2:4.2±0.6, 0.5±0.2%D, and 29.0±3.4, 42.4±3.6:28.6±3.3, 42.2±3.3%D in all subjects. There was no statistical significancy between UPTAKES of Ist test and those of II nd test.
From above data, it is suggested that the determination of thyroidal- ^{131}I-uptake with one week restriction of iodine intake is applicable procedure as that with two weeks restriction of iodine intake.

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Tc-99m UPTAKE RATE IN HYPERPLASTIC THYROIDITIS. Y. Ueno, J. Ito, S. Noguchi, N. Murakami, A. Noguchi, Noguchi Thyroid Clinic & Hospital, Beppu

Hyperplastic thyroiditis is a new entity of thyroiditis. Clinically, it occurs in young women, serum TSH is elevated and goiter can be easily diminished by administration of thyroid hormone. After the goiter has been diminished in size and medication is discontinued, patients remain euthyroid and clinically cured. Histologically, it is characterized by diffuse hyperplastic change of follicular epitherium without oxyphilic cells, diffuse lymphocytic infiltration and interstitial edema.
Neck/thigh ratio of Tc-99m uptake and tissue /blood ratio with needle biopsy specimen were studied in 14 patients with untreated hyperplastic thyroiditis and 14 patients with other types of thyroiditis(focal and diffuse). All the patients with hyperplastic thyroiditis and 4 of 14 patients with other types were hypothyroid. All the patients with hyperplastic thyroiditis had raised Tc-99m neck/thigh ratio and raised tissue/ blood ratio, contrasting to the other types of thyroiditis in which 4 of 14 showed slight elevation of neck thigh ratio and 11 of 14 showed less than normal tissue/blood ratio(normal range 8.0-10.7). We concluded that Tc-99m neck/thigh ratio is a useful tool for the diagnosis of this type of thyroiditis and that hyperplastic thyroiditis might not be a destructive change.

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CLINICAL EVALUATION OF MEASURING THYROIDAL IODINE CONCENTRATION BY IN VIVO X-RAY FLUORESCENT ANALYSIS. Noriaki Sekita,Youichi Takahashi,Yasuhito Sasaki,Keiko Imamura, Tokuichi Sakaki,Shinichiro Ushigome,Masamichi Fujii and Kazuhiko Someya. St.Marianna University School of Medicine, Kanagawa.

With the purpose to evaluate clinical usefullness of measuring thyroidal iodine concentration a simple apparatus was designed and constructed for in vivo x-ray fluorescent analysis.
Iodine concentration was measured in normal thyroids resected at autopsy in 21 males and 13 females. Iodine concentration measured on each lobe of the thyroid revealed 0.48±0.19mg/g(m±1S.D.) for males and 0.60±0.32 for females. In vivo measurement on healthy volunteers including 16 males and 14 females revealed 0.40±0.24mg/g(m ± 1S.D.) for males and 0.67±0.29 for females.
Seventy one measurments were performed on 68 patients with various thyroidal diseases. Iodine concentration was low in chronic thyroiditis and subacute thyroiditis. Most of Graves' disease showed normal or low iodine concentration regardless of status of treatments(pre-,under- or post-treatment) or thyroidal function. Fourteen measurments were performed on 13 patients with noduler goiter. Nodule/Gland ratio of I-127 concentration was 0.85±0.30(m±1S.D.) in 11 patients with cold nodule and 1.5 and 1.6 in 2 patients with hot nodule.