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INTRATHYROIDAL IODINE CONTENT AND STREAMING FEATURES OF THYROID GLAND DISEASES

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Background: It is familiar that 80% of the iodine entry into the thyroid gland is in the phenol ring of thyroid hormones. The density of the thyroid gland in Hounsfield unit (HU), determined by computed tomography (CT), is directly proportional to the concentration of intrathyroid stable iodine. Hence, the thyroid density index in HU reflects the level of hormone formation and the preserved iodinated thyroid hormones directly in the thyroid gland. The thyroid gland is the only endocrine organ that, after the synthesis of hormones, stores them up to 50 days in the thyroid structure and secretes hormones into the blood at the request of the body.

Aim: The purpose of this work is to study the level of intrathyroidal hormone in clinical manifestations of thyroid gland diseases using diagnostic method of computed tomography.

Materials & Methods: The study comprised 160 individuals, aged 45±6.8 years, with thyroid gland diseases, which are accompanied with functional impairment of thyroid gland. Individuals with hypothyroidism included 87 patients - group 1, 59 individuals with primary hypothyroidism (group 1a) including -18 with iodine-induced hypothyroidism (group 1b). 35 individuals with hyperthyroidism - group 2 (including 8 with iodine-induced hyperthyroidism (group 2a), 36 individuals with euthyroidism - control group. All individuals were examined clinically and laboratory with determination of hormones – TSH and fr.T4. The study of the content of intrathyroidal iodine was carried out using computed tomography (CT) on the apparatus “Symbia T16” (Siemens) with determination of thyroid density in units of Hounsfield (HU). For the standard level, the values of HU 85-140 units were taken.

Results: In individuals with iodine-induced hyperthyroidism (group 2a), the density in HU was significantly increased to 182±12, and

the TSH level was 0.03±0.01 mU/ml. In group 1 – HU was 85±9.0, and the level of TSH 0.04±0.01 mU/ml. In the group of individuals with hypothyroidism, the level of HU values also had a noticeable difference. In a subgroup of individuals with iodine-induced hypothyroidism (group 1b), the content of intrathyroidal iodine was above the reference values of 181±6 at a TSH of 6.0±0.9 mU / ml, and in group 1a (primary hypothyroidism) – HU was 53±7.0, and the TSH level was 9.28± 2.7 mU/ml. In the control group, the reported indicators were within reference values. Our studies showed that in all cases when there was an iodine-induced impairment of the thyroid function, the density in HU was above 140.

Conclusions: Contemporary assessment of thyroid density in HU with CT and TSH level in the bloodstream allows differential diagnosis between iodine-induced and true thyroid dysfunction, as well as correction for the error in determination of TSH concentration as a result of the influence of non thyroidal factors. Assessment of thyroid densities in HU in CT should be used for screening the risk of thyroid dysfunction and for determining the need for iodine prophylaxis and monitoring its effectiveness with a view to preventing iodine-induced transient thyroid dysfunction.

Biography

Ramchandra Sargar has completed his graduation (MBBS) from Smolensk State Medical University, Russia and clinical residency from RUDN University. Currently He is doing scientific research (PhD) from same university, (RUDN University). He has published the articles not only in Russian journals (Web of Science) but also in International Journals (Scopus). Area of research interest is early diagnosis of thyroid gland diseases.

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