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THE RELATIONSHIP BETWEEN THYROID GLAND FUNCTION AND THE RESULTS OF CORONARY ANGIOGRAPHY

Abstract. The aim of this study was the investigation of the relationship between functional changes of heart undergoing coronary angiography and functional condition of thyroid gland in patients with ischemic heart disease. 101 patients with ischemic heart disease were undergone coronary angiography. The plasma levels of low density lipoproteins, triglycerids and thyroid stimulating hormone and alternations in echocardiography were included to the trial. In addition, all patients were divided into two subgroups dependent on sex and TSH level, in which LDL and TG levels were compared. According to the results of coronary angiography the levels TSH, LDL and TG were different and its relationship with constricted coronary arteries were established.

Keywords: thyroid gland function, hypotireosis, hipertireosis, coronary angiography, thyroid stimulating hormone, low density lipoproteins, triglycerids.

Thyroidal gland diseases is the second most commonly endocrine disease in the world after diabetes mellitus[l]. Hormones secreted by the gland are considered to be important modifiers of metabolism. Thyroid hormones have the ability to affect the synthesis, mobilization and fragmentation of lipids, and the effects of the fragmentation are far superior to the synthesis effects [2]. As a result, thyroid disfunction, in particular hypothyroidism, is associated with dyslipidemia, which increases the risk of endothelial dysfunction, arterial hypertension, and cardiovascular disease. Thyroidal hormones have numerous effects on the cardiovascular system, including effects on the ability of heart contraction, electrophysiological functions and cardiac structure [3, 4, 5]. In addition, vascular tone, lipid levels and oxygen administration are also dependent on thyroid status. Due to heart contraction, thyroid hormones stimulate the systolic contraction frequency and strength and the frequency of diastolic emptying [5].

Electrophysiological effects can be demonstrated by increased tachycardia in hyperthyroid patients and the occurrence of tachycardia in calmness. Continuous activation of elevated thyroid hormones also accelerates heart protein synthesis and leads to the development of concentric hypertrophy [6, 7]. When the hyperthyroid status passes to the euthyroid status, the heart's hypertrophy also reverts to normal heart configuration. Increased thyroid hormone activity also leads to decreased tone of the muscle tissue in arterial vessels and, ultimately, a reduction in heart afterload [8]. Thyroid hormones are also not ineffective in the lipid spectrum. Hypothyroidism leads to an increase in cholesterol levels, as the LDLP (**Low-density lipoprotein**)is due to a decrease in its excretion and increased levels [9, 10].

Taking into consideration all these statements, the evaluation of the thyroid status in patients with ischemic cardio disease is of great importance. Given that Azerbaijan is an endemic zone for iodine

deficiency, it should be noted that dysfunction of the thyroid gland is one of the most pressing problems facing healthcare. Dyslipidemia observed in dysfunction of the thyroid gland, as the cause of the atherosclerotic process in the veins, can be attributed to the presence of certain dependence on the coronary artery injury. From this point of view, comparison of thyroidal gland hormones withcoronarography data is very purposeful, as coronarography data reflects the seriousness of atherosclerotic changes in the coronary artery [16].

The aim of the present study is to evaluate the impact on lipid spectrum of the thyroid status and the counting of the vasoconstrictionin patients suffering from ischemic cardio disease and exposed to coronary angiography, and to determine the interaction between them.

Material and Methods: 101 patients agedbetween 34-90 years (mean age 61, 69, 86)suffering from ischemic cardio-disease and with vasoconstriction of one or more coronary arteries of heart andwho were exposed to invasive operation of coronary angiography with by one or more narrow-neck coronary arteries were involved in the study. Anamnestic data were collected and examined by laboratory and instrumental methods after the patient was admitted to the hospital. The survey questionnaire included age, gender, nutritional properties, cigarette smoking, alcohol intake, presence of arterial hypertension and diabetes, family history of cardiovascular disease, and so on information. The objective examination included measurement of arterial pressure on both arms, anthropometric indicators (height and weight measurement).

Laboratory analyzes revealed blood levels of low density lipoproteins (LDLP), triglyceride levels (TG) and level of thyroid stimulating hormone (TSH) during blood test. Normally, TSH levels in blood serum range from 0.3 to 4, OuU/ml, LDLP<2.6 mmol/l, TG<1,7 mmol/l. Instrumental examinations like echocardiographicexaminationwas performed and signs of global and local hypokinesis and akinesis in heart, signs of hypertrophy of the left and right ventricles, cardiac ejection fraction and other indicators were recorded.

The results obtained after the invasive intervention of coronary angiography were compared with the results obtained from laboratory analyzes. Statistical processing of results has been carried out through the Microsoft Office Excel program. Mean performance indicators and standard deviation indicators, minimum and maximum indicators were calculated using the program and the correlation analysis was performed. The accuracy of the differences between the mean values of the results was calculated by the Student's t-criterion. The difference was statistically significant when $p < 0.05$.

Results and Discussion: 101 patients were exposed to coronary angiography intervention between 34-90 years (mean figure 61.48: l: 9.79). 68 of them are men (67.33%) and 33 women (32.67%). Patients have been tested for the amount of thyroid stimulating hormone (TSH), low density lipoproteins (LDLP) and triglycerides (TG) in blood plasma. The table below summarizes the results obtained in the general group of patients, men and women (see Table 1).

Table 1

Comparison of results of laboratory analyses in patient group separated for gender

Patient group	Age	TSH	LDLP	TG
General (n=101)	61.48±9.79	5.3±11.79	8.27±2.07	6.63±1.13
Male (n=68)	60.62±9.67	4.99±13.35	8.53±4.11	8.15±6.63
Female (n=33)	64.59±9.55	5.61±6.93	7.72±6.63	5.87±4.58
Norm		0.3-4.0 uU/ml	<2.6 mmol/l	<1.7 mmol/l
		p>0.05	p>0.05	p>0.05

As can be seen from the table, LDLP and TG indicators in patient groups were higher than normal. These indicators suggest that patients have high risk of cardiovascular disease.

The mean TSH in the male group was lower than that of the female group, but was higher in both groups than normal. LDLP and TG indicators were higher in male group.

Based on this, men have a higher risk of cardiovascular disease compared to women.

Based on the results of echocardiographic examination of the patients, 65 patients (64.36%) of 101 patients had left ventricular hypertrophy, global and local hypokinesis and low ejection fraction. Only 18 patients (17.82%) had global and local hypokinesis, and only 4 patients (3.96%) had left ventricular hypertrophy, and only 7 patients (6.93%) had no disorder.

In the control of TSH among 101 patients, 53 patients (52.47%) had euthyroid (normal functionality of the thyroid gland - TSH 0.3-4uU/ml), 19 patients (18.81%) had hyperthyroidism and 29 patients (28.71%) had hypothyroidism. Euthyroid patients were predominant in the study, and the number of hypothyroid patients were more frequently monitored than those with hypothyroidism. Only 21 of the patients with hyperthyroidism and hypothyroidism are treated for dysfunction of thyroidal gland. The following table presents TSH, LDLP and TG indicators in the blood serum of the patients with euthyroid, hyperthyroidismand hypothyroidism (see Table 2):

Table 2

Comparison of results of laboratory analyses in patient group separated for TSH amount

Group	Age	TSH	LDLP	TG
Euthyroid (n=53)	59.43±7.15	1.92±11.09	5.16±1.31	2.37±0.08
Hyperthyroid (n=19)	61.32±7.18	0.15±0.12	3.76±1.03	2.16±1.29
Hypothyroid (n=29)	65.77±14.14	14.83±18.98	5.56±1.53	2.33±0.69
Norm		0.3-4.0 uU/ml	<2.6 mmol/l	<1.7 mmol/l

The findings show that TSH indices in euthyroid, hyperthyroid and hypothyroid groups were normal, below normal and above normal, respectively and LDLP indices were lower in the hyperthyroid group compared to other groups and no significant difference was observed in TG levels. LDLP and TG levels were high in all three groups. Correlation coefficient between LDLP and TG among common patients was *r = 0.3*, correlation coefficient between TSH and LDLP was*r = 0.32*, i.e.there was a low correlation level.

The correlation between the rest indicators was not monitored. A weak correlation dependence(*r =0,23*) between TSH and TG in euthyroid patients, moderate correlation dependence between TSH and LDLPin the hypothyroidpatient group (*r = 0,36*), moderate correlation dependence between LDLPand TG(*r = 0,4*) were observed.

In 8 patients (7.92%) from 101 patients with invasive intervention of coronary angiography 1 vasoconstriction, in 12 patients (11.88%), 3 vasoconstriction,in 29 (28.7%) 4vasoconstriction, in 47 patients (46.5%) 5vasoconstriction, in 4 patients (3.96%) 6vasoconstrictionand only in 1 patient (0.99%) 7vasoconstriction cases were observed. The following table shows the frequency of occurrence ofvasoconstrictionfound in coronary angiography in euthyroid, hyperthyroid and hypothyroid groups (see Table 3):

Table 3

Level of vasoconstriction in patient groups separated for TSH amount

Groups	Euthyroid	Hyperthyroid	Hypothyroid
1 vasoconstriction	3.75%	10.53%	13.70%
3 vasoconstriction	5.66%	21.05%	6.89%
4 vasoconstriction	28.3%	47.37%	12.74%
5 vasoconstriction	52.8%	21.05%	51.72%
6 vasoconstriction	1.89%	-	10.34%
7 vasoconstriction	1.89%	-	-

The correlation relationship between the frequency of occurrence of vasoconstrictionin different groups was not statistically significant ($p < 0.05$). 5vasoconstrictionin the euthyroid and hypothyroid groups and 4vasoconstrictionin the hyperthyroid group were more common.

Patients are divided into groups according to the number of vasoconstriction. The following table presents mean values of *Thyroid simulating hormones* (TSH), *Low-density lipoprotein* (LDLP) and*triglyceride*(TG) and standard deviation indicators in patients with 1, 3, 4, 5, 6, 7 vascular contractions:

Table 4

Laboratory analyses comparison in patients with various number of vasoconstriction

Groups	TSH	LDLP	TG
1 vasoconstriction	5.47±7.89	4.62±2.18	2.09±0.78
3 vasoconstriction	9.69±28.48	4.5±1.15	2.08±0.46
4 vasoconstriction	2,92 ±4.35	4.7±1.15	2.25±0.88
5 vasoconstriction	5.16±8.26	4.7±1.31	2.43±1.0
6 and 7 vasoconstriction	9.6±9.65	5.71±1.3	2.6.5±0.64
Norm	0.3-0.4Uu/ml	<2.6 mmol/ml	<1.76 mmol/ml

Based on the findings, it can be noted that the group of patients divided by the number of narrowingvessels differed only by *thyroid simulating hormones* (TSH) indicators. LDLP (low-density lipoprotein) and TG (triglyceride)indicators have been highly monitoredin patient groups, but no significant differences observed.

LDLP(low-density lipoprotein) and TG (triglyceride) indicators were significantly higher in patients with vasoconstriction 5, 6, and 7. It can be estimated that there is a certain degree of dependence between the level of dyslipidemia and level of atherosclerotic process observed in the coronary vessels in the heart.

The subjection of lipid profile in patients with thyroid gland dysfunction had been reported based on results of various studies [11, 12, 13, 14, 15], however, there are some distinct conclusions and interpretations in this regard. There is lipid synthesis in hypothyroidism and reduction in fragmentation, resulting in lipid overgrowth and accumulation, as the reduction in fragmentation is in the foreground. The result of decreased lipid fragmentation may be due to decreased lipolytic activity of postheparin.

Based on our findings, the degree of dyslipidemia in the euthyroid hyper-and hypothyroid patients has not been significantly different. In all three groups, patients had high cardiovascular risk.

Thus, in patients with **ischemic cardio disease (ICD)** and subjected to coronary angiography, there is a wide variety of disorders of the thyroid gland in the various forms. Continuation of the study is appropriate in determining the effect of thyroid dysfunction treatment on the degree of dyslipidemia in patients with ischemic cardio disease.

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ПРИНЦИПИ ФУНКЦІОНАЛЬНОЇ РЕАБІЛІТАЦІЇ ХВОРИХ ПІСЛЯ РЕЗЕКЦІЇ БЕЗЗУБОЇ НИЖНЬОЇ ЩЕЛЕПИ З ПРИВОДУ ВИДАЛЕННЯ ЗЛОЯКІСНОЇ ПУХЛИНИ

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PRINCIPLES OF FUNCTIONAL REHABILITATION OF PATIENTS AFTER RESECTION OF AN EZABE LOWER JAW AS A RESULT OF REMOVAL OF A MALIGNANT TUMOR

Topicality. The duration and complexity of treating patients after surgery for removal of a malignant tumor of the maxillofacial region is that complex functional and cosmetic disorders occur against the background of a severe mental state. Postoperative defects of bone and soft tissues are eliminated by the methods of reconstructive plastic surgery, however, functional disorders of chewing, swallowing, and speech are more persistent and therefore need to perform a set of rehabilitation measures with targeted, progressive, consistent treatment and constant monitoring. The degree of restoration of morphological and functional disorders largely depends on the design features of the resection prosthesis, namely, the method of their fixation taking into account all possible areas of retention, staging, correct determination of central occlusion and the condition of antagonist teeth. Particularly difficult cases are when, after resection of the lower jaw, no teeth remain on the fragments, and the upper jaw is toothless. **The objective** of the study was to develop the principles of functional rehabilitation in patients after resection of the lower jaw, when both jaws are toothless. **Materials and methods.** The object of the study was patients undergoing treatment in an oncology clinic and who, according to indications, were planning to remove the lower jaw. In total, we observed 6 patients: 4 men and 2 women aged 55-62 years. After a clinical examination, together with an oncologist surgeon, a plan of surgical intervention, orthopedic treatment was outlined, mucosal compliance was determined, diagnostic models were studied, parallelometry, and speech therapy correction were performed. **Results.** All patients underwent a three-stage prosthetics procedure. At the first stage, a direct lower jaw prosthesis was made, a functional impression was taken, the central ratio of the jaws was determined, and the formation of the forming prosthesis was determined. At the second stage, a replacement denture is made. At the third stage, correction of occlusal contacts and phonetic correction of language movements were carried out together with a speech therapist. As a result of orthopedic treatment, the contours of the face and the shape of the oral gap were restored, the retention of the tongue in the oral cavity was ensured, the salivation stopped. Thus, the results of the study indicate the feasibility of manufacturing immediate prostheses. The percentage of errors will be significantly less if you take impressions and determine the central ratio in the preoperative period. The manufacture of immediate prostheses will significantly accelerate the normalization of impaired chewing, swallowing and speech functions even in severe disorders in the maxillofacial region. In the absence of conditions for fixation, it is especially necessary to draw up a zone of muscular equilibrium with modeling individual optimal thickness of the base and bed for the tongue. This sequence of orthopedic treatment has a positive effect on the mental state of the patient.