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VITAMIN D AND THYROID HORMONES IN PATIENTS WITH BREAST BENIGN TUMOR

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ვიტამინი D და ფარისებრი ჯირკვლის ჰორმონები პაციენტებში ძუძუს კეთილთვისებიანი სიმსივნის დროს

საბუნებისმეტყველო მეცნიერებებათა და ჯანდაცვის ფაკულტეტი, ბათუმის შოთა რუსთაველის სახელმწიფო უნივერსიტეტი, ბათუმი, საქართველო

რეზიუმე

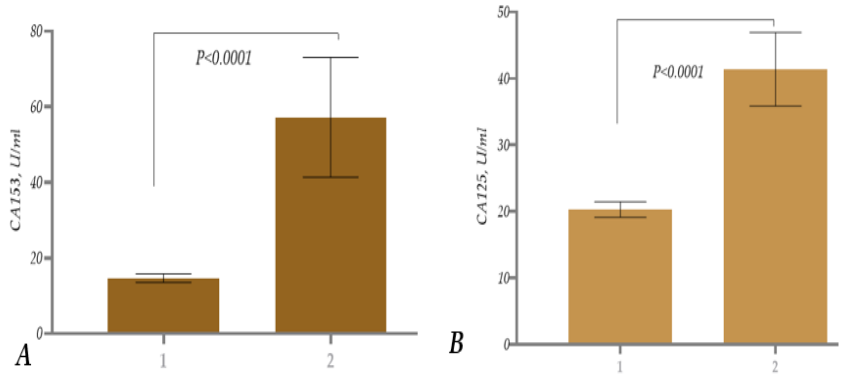
სარძევე ჯირკვლის კეთილთვისებიანი სიმსივნე (BBT) წარმოადგენს ყველა ასაკის ქალთა ჯანმრთელობის მნიშვნელოვან პრობლემას. ჩვენი კვლევის მიზანი იყო შეგვესწავლა სიმსივნის მარკერები - CA125 და CA153, თავისუფალი ტრიიოდთირონინის (FT3), თავისუფალი თიროქსინის (FT4), მასტიმულირებელ ჰორმონის (TSH) და D ვიტამინის რეპროდუქციული ასაკის ქალებში სარძევე ჯირკვლის კეთილთვისებიანი სიმსივნით (BBT) დაავადებული ქალების შემთხვევაში. საკვლევი ჯგუფი წარმოდგენილი იყო რეპროდუქციული ასაკის (35-45 წელი) ოცი პაციენტით (ათი ჯანმრთელი ქალი და ათი სარძევე ჯირკვლის კეთილთვისებიანი სიმსივნით). კვლევის შედეგად გამოავლინდა FT4 და FT3 ჰორმონალური დონის შემცირება, ხოლო ფარისებრი ჯირკვლის მასტიმულირებელი ჰორმონის (TSH) დონის მომატება. სარძევე ჯირკვლის კეთილთვისებიანი სიმსივნით (BBT) დაავადებულ პაციენტებში ასევე გამოვლინდა D ვიტამინის დაბალი დონე.

Introduction. Breast Benign tumor (BBT) consider as a significant breast health problem within women of all ages. It is well known that hormones, in particular, steroids and non-steroids, have been associated with breast tumors [1] [2] [3]. Vitamin D is a steroid hormone known to influence multiple organ functions in our body, including the heart, the skeletal system, the lungs, the intestines and the mammary glands. Its effect on mammary gland development is mediated through the actions of the vitamin D receptor (VDR) [4]. Vitamin D (soluble vitamin) as the precursor to the potent steroid hormone calcitriol has the widespread actions throughout the body in the role in calcium and phosphorus homeostasis; also vitamin D has significant implications within numerous research on its extraskeletal actions has linked vitamin D deficiency to an increased risk of numerous disease, including tumors. Notably, vitamin D is involving apoptosis, cell differentiation, anti-inflammatory, antiproliferative and inhibition of angiogenesis, invasion and metastasis, as well [5]. Besides of abovementioned, the thyroid hormones aslo have associated with Breast Tumors. For example, according to studies, there is an association between BBT and thyroid dysfunction. It is suggested that the prevalence of thyroid disorders in women with BBD is high [6]. Thyroid hormones have crucial implications for numerous processes in human organisms, including growth, development, and metabolism. The studies suggest that there is a relationship between thyroid hormones (THs) and the pathophysiology of tumorss [7] [1] [3]; According to studies, THs free triiodothyronine (fT3), free thyroxine (fT4), thyroid-stimulating hormone (TSH) have focal involvement in the process of differentiation and proliferation of breast tissue [8]. The blood levels of fT3 and fT4, antibodies against thyroid peroxidase and the TSH receptor were significantly altered at the time of primary diagnosis of BBT [9]. Notably, the thyroid hormones alteration was also revealed within Uterine fibroids [1]. General hormonal changes may lead to increas the risk also numerous tumors, including breast benign tumors [2]. In the present study we aimed to

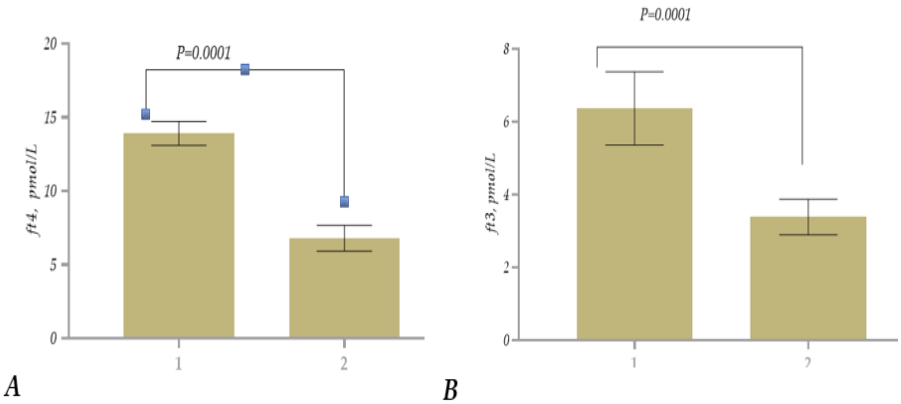
investigate he thyroid hormones free triiodothyronine (fT3), free thyroxine (fT4), thyroid-stimulating hormone (TSH) and vitamin D within benign breast tumor (BBT) during the reproduction ages.

Patients and Methods: 20 patients (10 patients in the control group and 10 patients in cases (Breast Benign Tumor) control group); All participants were in reproductive age (35-45 years). There were selected for analysis of the following parameters: Tumor markers: CA125 and CA153, hormones: fT3, fT4, TSH and vitamin D. The measurements were performed in the biochemical laboratory. The disease's clinical stages were evaluated using the cytological, morphological, ecosophical and computer methods. Therefore, the liquid biopsy specimens (venous blood samples) were taken on day 20th of the regular menstrual cycle and serum specimens were utilized for the test. The kits performed enzyme-linked immunosorbent assay (ELISA) for the quantitative determination of hormones. The statistical analysis was performed by Graphed Prism statistical program.

Results and discussion. The study, according to the levels of Tumor markers, both tumor markers: CA125 and CA153, were elevated in BBT group compared to control group ($P<0.0001$, respectively) **(Pic.1 A.B.)**. Notably, according to studies, fT3 and fT4 levels decreased within patients and differed significantly from controls (fT3 and fT4, $p<0.001$) as about TSH was significantly elevated within benign patients. Interestingly, Low levels of vitamin D were reported within benign tumors. ft3 level is 1.8-times decreased in cases compared to control group **(Pic. 2. B).** As about ft4, its leve was 2-fold decreased in BBT.

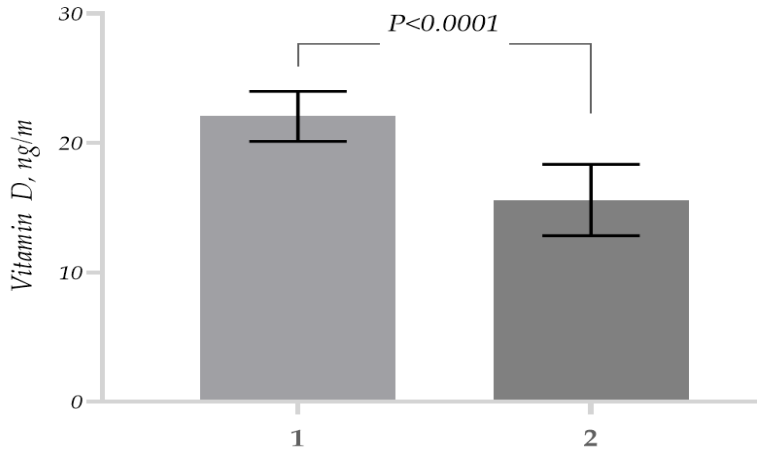


Pic. 1. The levels of Tumor Markers (CA153, CA125) in Breast Benign Tumor



Pic. 2. The levels of ft4 and ft3 within Breast Benign Tumor and control group

According to Vitamin D levels, our present study revealed that its level was 1.4-fold decreased within Breast benign tumors compared to the Control group **(pic. 3.).**



Pic. 3. The levels of Vitamin D within BBT and control group

It is suggesting that to specify the role of thyroid hormones in breast tumors [8]. As for Vitamin D, the studies confirm that D vitamin contribution and significant role in carcinogenesis are already confirmed. In particular, Vitamin D, a precursor of 1,25-dihydroxy vitamin D as a steroid hormone, is involved in numerous cellular processes within normal and cancerous cells [10]. Moreover, it may has the responsibility for a pleiotropic anticancer effect [11]; accordingly, Vitamin D affects many cellular processes via the VDR in the organism. The study suggests the vitamin D receptor (VDR) role in the on cell proliferation[12] [11] [13][14] [15] [16]. Further investigations are required for understanding the role of vitamin D within Breast tumors.

Conclusion: Thus, according to our studies, it can be concluded that in benign breast tumor revealed elevated levels of Tumor markers: CA125 and CA 153, the hypofunction of thyroid glands; Notably, the studies confirm the decrease in ft4 and ft3 and increase of the thyroid-stimulating hormone; The decrease level of Vitamin D also revealed in BBT.

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САЛОМЕ ГЛОНТИ, РУСУДАН ВАДАЧКОРИЯ, ДЖУМБЕР УНГИАДЗЕ

ВИТАМИН D И ТИРЕОИДНЫЕ ГОРМОНЫ ПАЦИЕНТОВ С ДОБРОКАЧЕСТВЕННОЙ ОПУХОЛЬЮ МОЛОЧНОЙ ЖЕЛЕЗЫ

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РЕЗЮМЕ

На сегодняшний день доброкачественная опухоль молочной железы (ДБМЖ) считается одной из ниболее серьезных проблем здоровья женщин в независимости от их возраста. Целью настоящего исследования является изучение уровня свободного трийодтиронин (FT3), свободного тироксина (FT4), тиреотропного гормона (TSH) и витамина D при доброкачественной опухоли груди (ДБМЖ) среди женщин репродуктивного возраста. В ходе исследования наблюдались двадцать пациентов репродуктивного возраста от 35 до 45 лет (десять пациентов в контрольной группе и десять - с установленным диагнозом доброкачественной опухоли груди). Следует отметить, что проведенные исследования подтверждают снижения уровня FT3, FT4 и повышение содержания уровня тиреотропного гормона; также было выявлено снижение уровня витамина D среди пациентов с доброкачественной опухолью молочной железы (ДБМЖ).

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SUMMARY

The Breast Benign tumor (BBT) is currently considered a significant breast health problem within women of all ages. In the present study, we aimed to investigate the Tumor markers CA125 and CA153, thyroid hormones free triiodothyronine (FT3), free thyroxine (FT4), thyroid-stimulating hormone (TSH), and vitamin D within benign breast tumor (BBT) during the reproduction ages. Twenty patients (ten patients in the control group and ten patients in cases (Breast Benign Tumor); Notably, the studies confirm the decrease in FT4 and FT3 and increase of the thyroid-stimulating hormone (TSH). In addition, the decreased level of Vitamin D is also revealed in BBT.

Key Words: Vitamin D, Breast Benign Tumor, BBT, Thyroid Hormones