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THE VITAMIN D AND AUTOIMMUNE THYROIDITIS IN PEDIATRIC AGE

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ვიტამინი D და აუტოიმუნური თირეოდიტი პედიატრიულ ასაკში
საბუნებისმეტყველო მეცნიერებათა და ჯანდაცვის ფაკულტეტი,
ბათუმის შოთა რუსთაველის სახელმწიფო უნივერსიტეტი, ბათუმი, საქართველო

რეზიუმე

ფარისებრი ჯირკვლის აუტოიმუნური დაავადებები, რომელთა შორისაა აუტოიმუნური თირეოდიტი, წარმოადგენენ ფართოდ გავრცელებულ დაავადებებს. აუტოიმუნური თირეოდიტის შემთხვევები გვხვდება პედიატრიულ ასაკშიც. ჩვენი კვლევის მიზანს წარმოადგენდა D ვიტამინის შესწავლა აუტოიმუნური თირეოდიტით დაავადებული პედიატრიული ასაკის პაციენტებში. კვლევამ აჩვენა D ვიტამინის შედარებით დაბალი დონე აუტოიმუნური თირეოდიტის დროს, საკონტროლო ჯგუფთან შედარებით ($p=0.017$).

Introduction. Autoimmune diseases (AD) of the thyroid gland are the most common pathology globally [1]. Autoimmune thyroid disease (ATD) consider as a polygenic and multifactorial disorder. Numerous factors are contributed to the development of autoimmune thyroiditis (AT) [2]. Among risk factors are genetics [3,4], Iodine deficiency, radiation, drugs, alcohol, Selenium and vitamin D deficiency, infections, hormonal imbalance, and others [5,6,7]. Notably, the hormones produced by the thyroid gland, thyroxine, and triiodothyronine, have several functions during the body's metabolic processes [6]. The altered function of mentioned hormones has a significant contribution within AT [8]. The hypothalamus' hormone thyrotropin-releasing hormone - TRH stimulates the release of thyroid-stimulating hormone (TSH), which stimulates the thyroid gland to regulate the secretion of thyroid hormones. In general, the development of AT is a complex and multistage process [9], in which Vitamin D has significant implications for calcium absorption and maintaining bone health, particularly for pediatric ages. Vitamin D's primary function is the regulate calcium and phosphorus metabolism and maintains skeletal health. Like hormones, vitamin D exerts its function via a nuclear receptor - vitamin D receptor (VDR). It's suggested that VDR has been identified in various cells and tissues where they are implicated within numerous cellular processes [10]. Vitamin D is active as an immunomodulator within autoimmune diseases [11,12]. Vitamin D deficiency is a widely observed public health problem among children of different ages. According to studies, the low level of Vitamin D is associated with AT in children but the mechanism not clear [13]. In this present study, our aim to investigate the Vitamin D level within pediatric age patients with AT.

Material and methods: In the study, we include twelve health control (age - 12 ± 4.5) and ten patients with Autoimmune Thyreoditis (age - 15 ± 1.7); The samples were collected from the LDT Health clinic. All patients signed informed consent before the collected samples. The whole blood of the patients was used as the study material. All participants were females. The diagnosis of Autoimmune thyroiditis was defined using the anti-thyroid peroxidase antibodies (anti-TPO) and thyroid ultrasonography. The appropriate protocols were evaluated for the

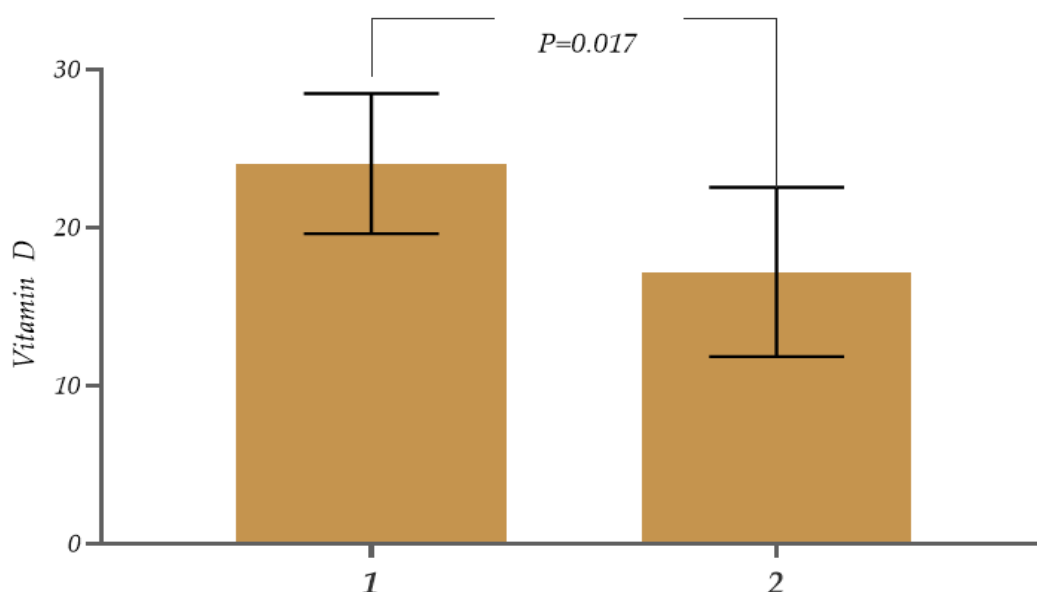
Anti-TPO, TSH, FT4, and Vitamin D measurement by using the ELISA methods. For statistical analysis, Graphed Prism was used, version 8.1. $P < 0.05$ is considered statistically significant.

Results and discussion. According to our study, the levels of Anti-TPO were elevated 30-times within AT group compared to the control group, $P=0.0001$, respectively. The TSH levels were not significantly altered but were 1.5-times high within the AT group compared to the control group. As about ft4, its level was elevated within AT compared to the control group (Table 1).

Table 1. The Anti-TPO, TSH, and ft4 levels within the control Group and AT

The study Object	Thyroid peroxidase antibodies (Anti-TPO) AU/ml	Thyroid-stimulating hormone (TSH) IU/ml	Thyroxin (ft4) ng/l
Control Group	7.550±0.2121	2.501±2.187	1.320±0.9617
Autoimmune Thyroiditis	232.7±128.3	3.759±1.902	1.885±0,1344
	$P=0.0001$	$P=0,5770$	$P=0,4971$

The level of Vitamin D was below its normal range in both groups (control, AT); Notably, its level was low 1.4-times within AT groups compared to the control group, $p=0.017$ (Pic.1).



Pic. 1. The D vitamin Levels within AT and control group

There is evidence supporting the relationship between low levels of vitamin D and AT [14]. The same study suggests a potential role of Vitamin D in developing HT and its progression to hypothyroidism. Moreover, Vitamin D plays an essential role in modulating the immune system. Also, its essential role within a significant pathway is well known. May low vitamin D levels have also been correlated with AT within pediatric age.

Conclusion. Low level of Vitamin D revealed within AT compared to healthy controls. Therefore, vitamin D may have some involvement in the development of autoimmune diseases in the pediatric age.

Abbreviation: Thyroperoxidase antibodies - AT-TPO; Thyroid-stimulating hormone - TSH; Thyroxine - FT4 Thyrotropin-releasing hormone - TRH; Vitamin D.

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НИНО КЕДЕЛИДЗЕ, ИРИНА НАКАШИДЗЕ*
ВИТАМИН D И АУТОИММУННЫЙ ТИРЕОИДИТ В ДЕТСКОМ ВОЗРАСТЕ
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РЕЗЮМЕ

Аутоиммунные заболевания щитовидной железы, в том числе аутоиммунный тиреоидит, являются широко распространенными заболеваниями. Аутоиммунный тиреоидит (АТ) встречается в детском возрасте. Целью является изучение витамина D у пациентов детского возраста с аутоиммунным тиреоидитом. Исследование показало, что уровень витамина D в группе АТ низкий по сравнению с контрольной группой ($p = 0,017$).

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SUMMARY

Autoimmune diseases of the thyroid gland, including autoimmune thyroiditis, are widespread diseases. Autoimmune thyroiditis (AT) is found within the pediatric age. The aim is to study vitamin D within pediatric age patients with autoimmune thyroiditis. The study showed that the vitamin D level is low within AT compared to the control group ($p=0.017$).

Keywords: Autoimmune thyroiditis, Pediatric age, Vitamin D.

