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Irisin Levels Increases After Treatment in Patients with Newly Diagnosed Hashimoto Thyroiditis

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Abstract

Background and Aim: Irisin is a newly identified myokine secreted by skeletal muscle and has significant effects on body metabolism. Thyroidal functional state has a profound influence on the metabolism of human body. Therefore. the aim of this study was to investigate the possible changes in serum irisin concentrations before and after treatment in hypothyroid subjects.

Methods: The study included 26 patients with overt hypothyroidism due to Hashimoto thyroiditis and 19 healthy subjects. Baseline serum thyroid function tests. presence of thyroid autoantibodies and levels of creatine kinase (CK) and irisin were measured in both groups. All measurements in the hypothyroid group were repeated after euthyroidism was achieved.

Results: Serum irisin levels were significantly lower in the hypothyroid groups than the control group ($p<0.001$). Negative correlation between irisin and TSH and CK levels ($r=-0.623$. $p<0.001$. $r:-0.389$. $p:0.008$. respectively) and a positive correlation between irisin and fT4 levels ($r:0.570$. $p<0.001$) was found. Serum CK levels decreased significantly after treatment($p<0.001$).Serum irisin levels significantly increased (from 57.4 U/L to 99.8U/L. $p<0.001$) when the hypothyroid patients were treated to achieve euthyroidism.

Conclusions: To the best of our knowledge this is the first study providing insight that low serum irisin levels significantly increased following treatment to euthyroid state in overt hypothyroid patients with Hashimoto thyroiditis. The negative correlation between CK and irisin levels found in our study might underline a possible relation between irisin level and muscle damage in patients with hypothyroidism due to Hashimoto's thyroiditis. The increase in irisin levels and the decrease in CK levels after treatment may indicate myopathy due to hypothyroidism. Larger scale studies are needed to confirm these results and to ensure irisin as a possible biomarker of Hashimoto's thyroiditis.

Keywords: Irisin. Hashimoto thyroiditis. overt hypothyroidism

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Table 1. Demographical characteristics and laboratory findings of hypothyroid and control groups.

			Control group (n=19)	Hypothyroid group (n=26)	P value
Gender	Male	n (%)	5 (26.3)	2 (7.7)	0.198
	Female	n (%)	14 (73.7)	24 (92.3)	
Age, years		Mean±SD	31.7±4.1	34±8.9	0.262
BMI, kg/m^2		Mean±SD	24.6±3.25	26.8±4.1	0.060
TSH, µIU/mL		Median (min-max)	2.1 (1.1-3.8)	12.6 (8.3-100.9)	<0.001
fT4, ng/dL		Median (min-max)	1.2 (1-1.57)	0.7 (0.4-0.8)	<0.001
fT3, pg/mL		Mean±SD	3.29±0.1	2.85±0.4	0.001
AntiTPO, U/mL		Median (min-max)	28 (25-48)	1300 (122.6-1300)	<0.001
AntiTG, U/mL		Median (min-max)	15.3 (15-34.3)	219 (15-500)	<0.001
Irisin, ng/ml		Mean±SD	80.1±12.1	58.8±13.8	<0.001
CK, U/L		Mean±SD	54.4±24.5	103.6±38.7	<0.001

Anti-TPO. anti-thyroid peroxidase; anti-TG. anti-thyroglobulin; BMI. body mass index; CK. creatine kinase; fT3. free triiodothyronine; fT4. free thyroxine; TSH. thyrotropin.

Table 2. Comparison of thyroid functions and irisin levels before and after treatment in the hypothyroid group.

Parameters	Before treatment (n=26)	After treatment (n=26)	P value	
BMI (kg/m^2)	Mean±SD	26.8±4.1	27.05±4.4	0.295
TSH (µIU/mL)	Median (min-max)	12.6 (8.3-100.9)	2.4(0.78-3.9)	<0.001
fT4 (ng/dL)	Median (min-max)	0.7 (0.4-0.8)	1.06 (0.9-1.6)	<0.001
fT3 (pg/mL)	Mean±SD	2.85±0.4	3.1±0.3	0.012
Anti-TPO (U/mL)	Median (min-max)	1300 (122.6-1300)	1182 (82.6-1300)	0.003
Anti-Tg (U/mL)	Median (min-max)	219 (15-500)	164.2 (15-500)	0.019
Irisin (ng/ml)	Median (min-max)	57.4 (30.2-91.8)	99.75 (56.6-290.1)	<0.001
CK (U/L)	Mean±SD	103.6 (45-194)	63 (30-114)	<0.001

Anti-TPO, anti-thyroid peroxidase; anti-TG, anti-thyroglobulin; BMI, body mass index; CK, creatine kinase; fT4, free thyroxine; fT3, free triiodothyronine; TSH, thyrotropin.