Changes in irisin, titin and dystrophin concentrations in patients with overt thyroid dysfunction.

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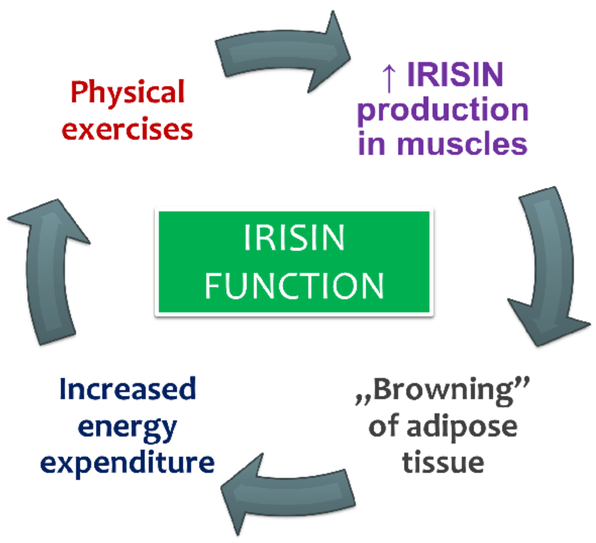
INTRODUCTION:

Many original research studies describes significant impact of thyroid hormones on muscle tissue. Hypo- and hyperthyroidism cause both functional and structural damage of muscles presented by many signs and symptoms of thyroid myopathy. Thus, it is interesting to compare the impact of thyroid dysfunction on hormones secreted by muscles – myokines, in example newly discovered irisin and main structural muscle proteins. Titin and dystrophin serum concentrations similarly to creatine kinase (CK) level may be altered by thyroid myopathy reveling the degree of muscle damage.



AIM:

The main goal of the project is to assess serum concentration of irisin – newly discovered myokin, CK and and other novel markers of skeletal muscle injury (dystrophin - DMD, titin - TTN) in patients with thyroid function impairment (overt hypo- and hyperthyroidisim) and in healthy control subjects.

METHODS:

The study enrolled 97 patients, newly diagnosed with overt thyroid dysfunction (48 with hypothyroidism and 49 with hyperthyroidism) and 40 healthy control subjects. Additionally, patients diagnosed with hypothyroidism were divided into two subgroups – long-lasting and short-term dysfunction. All subjects underwent routine clinical examination, laboratory tests (irisin, TTN, DMD, thyroid-stimulating hormone - TSH, free thyroid hormones, anti-thyroid autoantibodies and CK concentrations), and thyroid ultrasound examination.

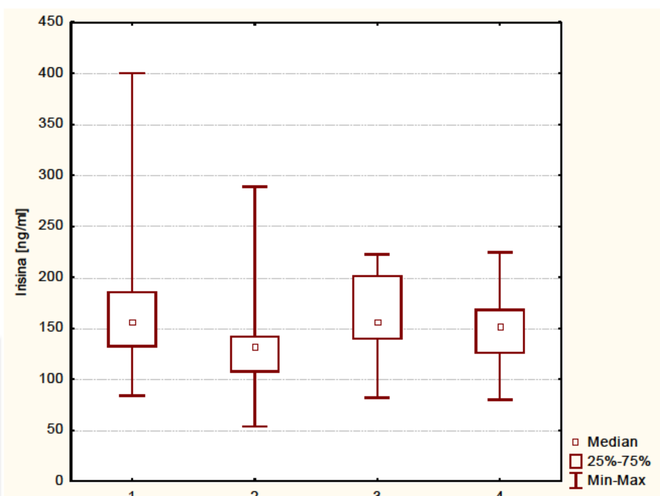
RESULTS:

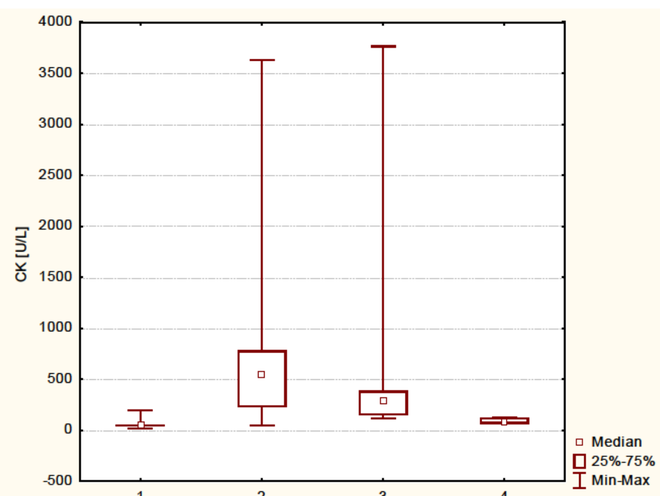
Median values [25%-75%] of:	Hyperthyroidism	Long-lasting Hypothyroidism	Short-term Hypothyroidism	Control group	p
Irisin [ng/ml]	155.40 [131.60 - 185.90]	132.30 [106.80 – 142.40]	156.00 [138.9 – 201.7]	151.60 [125.3 – 168.8]	P=0.014
CK [U/L]	49.50 [41.50 – 56.50]	550.00 [228.00 – 784.00]	296.00 [150.50 – 387.00]	86.00 [66.00 – 124.00]	P=<0.001
DMD [ng/ml]	2.405 [1.730 – 6.290]	1.995 [1.600 – 6.920]	4.350 [3.170 – 8.500]	6.115 [3.200 – 8.500]	P=0.035
TTN [ng/ml]	16.550 [9.960 – 44.180]	14.985 [9.425 – 46.336]	45.110 [21.510 – 52..070]	43.990 [25.515 – 51.72]	P=0.0065

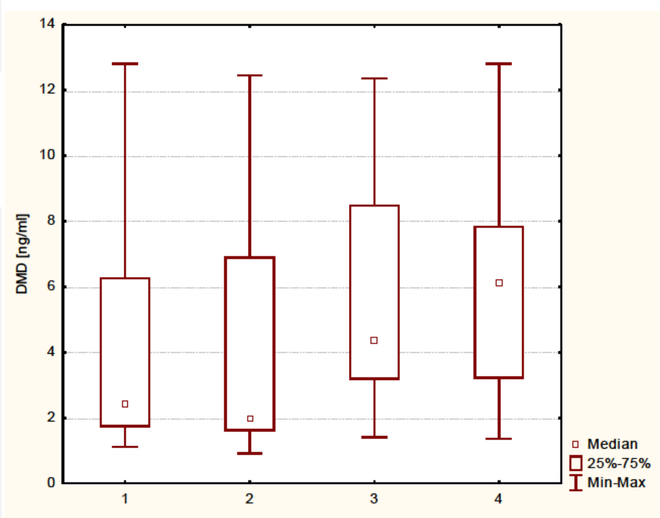
RESULTS cd:

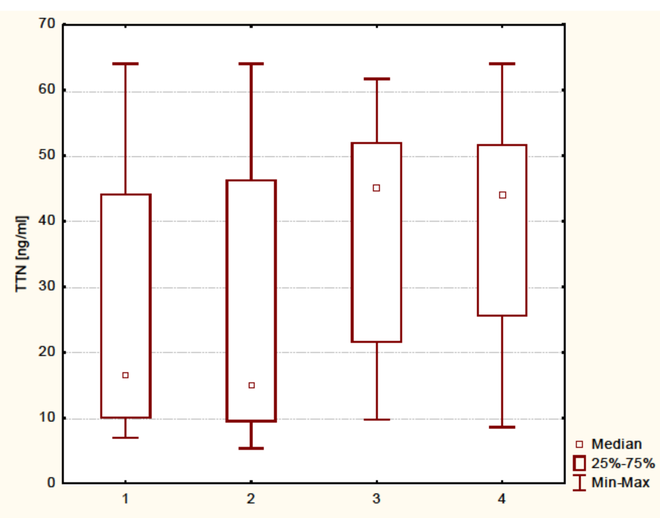
The mean serum irisin level was lower in patients with long-lasting hypothyroidism than in other three groups (p=0.014). There was generally statistical difference in DMD levels between groups (p=0.035), with the highest dystrophin level in healthy controls and lowest in hyperthyroid patients, however post hoc analysis revealed the values at the border of statistical significance (p=0.076) between these groups. Similarly, the highest TTN levels were presented by healthy controls, and the lowest by hyperthyroid patients (p=0.011) and group with long-lasting hypothyroidism (p=0.052). CK levels were statistically higher in long-lasting and short-term hypothyroidism than in hyperthyroid and control subjects (p<0.05).

1 – hyperthyroidism; 2- long-lasting hypothyroidism; 3 – short-term hypothyroidism; 4 – control group.









CONCLUSIONS:

Obtained results suggest that thyrometabolic state have an important impact on irisin level. That might be explained with multiply impact of hypo- and hyperthyroidism on muscle tissue, both dysfunction and destruction - demonstrated with high CK level. However, other novel markers of skeletal muscle injury do not present the same dynamics of changes. Since DMD and TTN play an important role in the structure of skeletal muscle, the changes in their serum concentrations may visualize only the very deep muscle injury or prolonged dysfunction.

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