Assessment the relationship between TSH and selected anthropometric parameters - *preliminary report*

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Introduction

The majority of secreted hormones influence the whole body, its weigh and constitution as the results of ongoing metabolism. Scientific studies have reported the existence of relationship between the TSH and selected anthropometric parameters such as BMI or body weight.

Aim

The aim of the study was to assess the relationship between the value of TSH and selected anthropometric parameters in the group of endocrine patients.

Materials and methods

The study involved 87 patients with thyroid disorders who were admitted to the Endocrinology Department in 2013. We excluded patients treated with statins and patients with TSH values below 0,35 uIU/ml. Blood samples for TSH concentration were collected from patients in the morning. Anthropometric parameters were measurement in the morning in accordance with generally accepted methodology. The collected data were statistically analyzed with *Spearman Rank Correlation* . α = 0,05.

Table 1. Characteristic of the whole analyzed group- *descriptive statistics*

	N	Mean	Median	Min	Max	Lower quartile	Upper quartile	Standard deviation
Age	87	42,98	38,00	18,00	82,00	31,00	58,00	15,79
Sex	87	1,10	1,00	1,00	2,00	1,00	1,00	0,31
Body mass kg	87	72,99	69,10	21,90	151,60	56,60	83,60	22,87
Height cm	87	163,73	163,00	133,00	192,00	159,00	170,00	8,57
BMI	87	27,24	25,60	13,50	54,50	22,60	31,80	7,35
Waist circumference cm	87	88,30	86,50	60,00	136,00	74,00	98,00	17,59
Hip circumference cm	87	104,33	102,00	77,00	156,00	95,00	111,00	13,62
Arm circumference cm	87	29,70	29,50	16,00	51,00	26,00	32,50	5,31
Calf circumference cm	87	36,87	36,00	26,00	53,50	34,00	39,50	4,72
WHR	87	0,84	0,83	0,68	1,10	0,77	0,90	0,10
WHtR	87	53,99	52,60	36,59	84,08	45,96	60,00	10,59
Dynamometer- left hand kg	87	30,36	29,50	13,00	67,16	25,50	33,80	9,00
TSH (uIU/ml)	86	2,91	1,71	0,35	73,37	1,05	2,64	7,82
Tłuszcz % Fat %	87	33,00	33,30	3,00	56,20	25,80	39,80	10,10
Fat kg	87	25,73	23,80	1,10	83,30	14,80	33,40	14,46

Results

Characteristic of the group **Table 1**. In the preliminary stage of the study we did not find any statistically significant correlation in TSH concentration and waist circumference (R=0,16;p=0,1221), hip circumference (R=-0,02;p=0,8023), BMI score (R=0,04;p=0,6873), percentage of body fat (R=0,01;p=0,8807), lean body mass (R=-0,01;p=0,8915) and muscle mass (R= -0,02;r=0,8296). There were observed positive significant correlation between the **TSH concentration and WHR index (R=0,25;p=0,0160)**, and **between TSH and WHtR ratio (R=0,21;p=0,0420).** In addition the results showed a negative correlation between **TSH concentration and the strength of hand (R=-0,24;p=0,0215).** **Table 2.**

Spearman rank correlation between analyzed traits

	N	R	t(N-2)	p value
TSH (uIU/ml) & Age	86	0,194275	1,81515	0,073070
TSH (uIU/ml) & Body mass	86	-0,021294	-0,19521	0,845702
TSH (uIU/ml) & Heigh	86	-0,132006	-1,22054	0,225675
TSH (uIU/ml) & BMI	86	0,044016	0,40381	0,687379
TSH (uIU/ml) & waist circumference (cm)	86	0,167950	1,56147	0,122173
TSH (uIU/ml) & Hip circumference (cm)	86	-0,027385	-0,25108	0,802365
TSH (uIU/ml) & Arm circumference (cm)	86	-0,018504	-0,16962	0,865717
TSH (uIU/ml) & Calf circumference (cm)	86	-0,060735	-0,55768	0,578547
TSH (uIU/ml) & WHR	86	0,259079	2,45844	0,016008
TSH (uIU/ml) & WHtR	86	0,219778	2,06478	0,042028
TSH (uIU/ml) & Dynamometer left hand (śr) L	86	-0,247665	-2,34287	0,021500
TSH (uIU/ml) & Fat %	86	0,016416	0,15048	0,880747
TSH (uIU/ml) & Fat kg	86	-0,006189	-0,05673	0,954899
TSH (uIU/ml) & Lean Body mass	86	-0,014917	-0,13673	0,891571
TSH (uIU/ml) & Muscle mass kg	86	-0,023541	-0,21582	0,829652
TSH (uIU/ml) & Water kg	86	-0,015823	-0,14504	0,885030
TSH (uIU/ml) & Water %	86	-0,040835	-0,37457	0,708921
TSH (uIU/ml) & BMR kcal	**86**	**-0,037210**	**-0,34127**	**0,733751**

Table 2 Spearman rank correlation between analyzed traits

Conslusions

The thyroid function *(based on screening TSH exam)* could affect body constitution and muscle strength. Enlargement of the studied group is necessary to confirm the observation.