

Departament of Pediatrics and Endocrinology Medical University of Warsaw

# Thyroid function in obese children and its correlations with chosen atherogenic risk factors

#### INTRODUCTION

Moderately elevated thyroid-stimulating hormone (TSH) with normal serum concentrations of free thyroxine (fT4), suggesting subclinical hypothyroidism, is the most common hormonal abnormality in obese children.

Controversy remains whether thyroid dysfunction related to obesity has an influence on the cardiovascular risk factors.

THE AIMS The aim of the study was to assess correlation between TSH and fT4 and chosen atherogenic risk factors in obese children and adolescent.

#### MATERIAL AND METHODS

**STUDY GROUP** - 110 obese children (48 girls, 62 boys), aged 5.25-17.91 years (11.54 ± 2.9 yrs) Obesity was defined using IOTF criteria. Mean BMI was  $29.5 \pm 4.9 \text{ kg/m}^2$ , SDS BMI  $2.78 \pm 0.49$ **CONTROL GROUP** - 38 healthy children (13.4  $\pm$  2.63 yrs). Mean BMI 18.7  $\pm$  2.7 kg/m<sup>2</sup>

**CAROTID ULTRASONOGRAPHY**: intima – media thickness (IMT)

STATISTICAL ANALYSIS (SPSS 19 software): Spearman correlation analysis, T test or Mann-Whitney test, multiple linear regression analysis

#### **RESULTS**

- 1. Obese children had higher mean serum TSH levels compared to their lean peers  $(2.14 \pm 0.97 \,\mu\text{IU/ml vs.} 1.47 \pm 0.63 \,\mu\text{IU/ml,} p = 0.000)$  and an adverse atherogenic lipids profile (Table 1).
- 2. Serum TSH values correlated with TC/ HDL-C (r = 0.286, p = 0.000),

TG/ HDL-C (r = 0.236, p = 0.004), LDL-C/ HDL-C (r = 0.281, p = 0.001), IMT (r = 0.290, p = 0.003),

but not with adiponectin (p = 0.7).

- 3. In multivariate regression analysis TSH weakly correlated only with IMT after adjustment for age, gender and BMI SDS. This relationship weakened after considering lipid profile (Table 2).
- 4. Serum fT4 concentrations were comparable between groups. No relationship was found for fT4.

Ind	ependent variables	β	SE	P-value
Model 1	Age	0.008	0.007	0.256
	Gender	- 0.052	0.036	0.153
I	BMI SDS	0.047	0.041	0.259
]	ΓSH	0.041	0.020	0.041
Model 2	Age	0.008	0.007	0.282
	Gender	-0.052	0.038	0.170
I	BMI SDS	0.049	0.043	0.255
7	ΓC	0.000	0.002	0.844
I	LDL-C	0.000	0.002	0.839
]	ΓG	0.000	0.000	0.879
]	ΓSH	0.040	0.021	0.058

Variable	Obese group (n=110)	Control group (n=38)
TSH (μIU/ml)	$2.14 \pm 0.97$	$1.47 \pm 0.63***$
fT4 (ng/dl)	$0.99 \pm 0.17$	$1.00 \pm 0.11$
TC (mg/dl)	$177.47 \pm 29.52$	156.77 ± 23.85***
HDL -C (mg/dl)	$44.03 \pm 10.79$	55.86 ± 12.53***
LDL-C (mg/dl)	$106.31 \pm 27.19$	84.26 ± 25.64***
TG (mg/dl)	$135.32 \pm 63.38$	77.09 ± 35.87***
TC/HDL-C	$4.25 \pm 1.25$	$2.95 \pm 0.83***$
TG/HDL-C	$3.41\pm 2.16$	$1.51 \pm 0.95***$
LDL-C/HDL-C	$2.57 \pm 0.97$	$1.63 \pm 0.71***$
Adiponectin (µg/ml)	$13.26 \pm 5.94$	$15.24 \pm 5.65$
IMT (mm)	$0.55 \pm 0.15$	$0.53 \pm 0.14$

### Table 1.

Data are: mean ± SD, TC = total cholesterol, TG = triglycerides, HDL-C = HDL cholesterol, LDL-C = LDL cholesterol, \*\*\* P < 0.001

## Table 2.

IMT dependent variable, B = non-standardized coefficient, SE = standard error

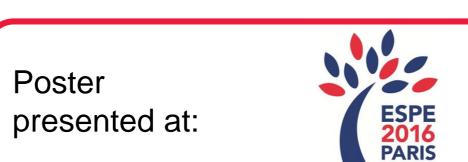
Poster

## CONCLUSIONS

Elevated level of TSH in obese children did not seem to impact atherogenic lipid indicators and carotid IMT. Therefore, adverse lipid profile should still be considered the main risk factor for development of cardiovascular disease in obese children.

The authors declare no conflicts of interest









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