

Thyroid hormones and risk factors in obese and overweight children

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Introduction:

Thyroid stimulating hormone (TSH) and free thyroxine (fT4) levels in children with obesity vary from normal to elevated. Many mechanisms have been inculcated such as the action of hormone leptin to the hypothalamus, the thyroid hormone resistance, mutations in the TSH-R gene, mitochondrial dysfunction, autoimmunity or the increased energy expenditure. Thyroid hormones influence body weight, heart rate, serum lipids as well as carbohydrates metabolism. Consequently, these hormones could affect the metabolic disturbances which may coexist in parallel to obesity.

Objective and hypotheses:

The aim of current study is to determine the relation between thyroid function in obese and overweight children and clinical-laboratory parameters which have been associated with increased risk of cardiovascular diseases.

Method:

Thyroid hormone levels (TSH and FT4) of 380 overweight and obese children, aged 3 to 15.5 years old, were measured and correlated with several parameters such as BMI, blood pressure, waist circumference, fasting blood glucose, insulin levels and lipid profile.

Results:

Ten percent of obese and overweight children had elevated TSH levels ($>5 \mu\text{IU/ml}$).

Very weak positive correlation was found between TSH and total cholesterol.

Very weak negative correlation was reported between FT4 and BMI, HDL and LDL and moderate negative correlation between FT4 and waist circumference.

No significant differences were observed between the other parameters and thyroid hormones.

LDL levels were found significantly higher in children who had elevated TSH levels compared to those with low TSH levels.

Conclusion:

High TSH levels are associated with dyslipidemia. In clinical practice, elevated TSH levels can be used as cardio-metabolic risk factor in obese and overweight children. Further studies with greater power are needed to detect the cause and effect relationship between obesity severity and thyroid function in obese children and adolescents.

