

Is There Any Influence of TSH Serum Levels on Insulin Resistance in Euthyroid Adolescents with Polycystic Ovary Syndrome?

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BACKGROUND

Few previous studies suggested an association between insulin resistance (IR) and TSH serum levels in euthyroid patients. This relation could have some particularities in populations characterized by intrinsic insulin resistance like polycystic ovary syndrome (PCOS) patients. In particular in adolescent population this relationship was not previously studied.

OBJECTIVES

The aim of our study was to analyze the relationship between IR and TSH serum levels in adolescent euthyroid PCOS patients.

METHODS

We performed a cross-sectional study on 85 adolescent PCOS patients with normal thyroid function (mean age 18.05 ± 1.65 years, range 13–20 years, mean BMI 25.5 ± 6.9 kg/m²) diagnosed based on Rotterdam Consensus criteria. All the patients were evaluated by clinical and hormonal exam. HOMA-IR was calculated as an index of IR [(fasting blood glucose mg/dL x fasting insulin μ UI/mL)/405] and free androgen index (FAI) was calculated as an index of bioavailable testosterone (total testosterone nmol/L x 100/SHBG nmol/L). Variables with non-Gaussian distribution were log-transformed.

CONCLUSION

Although TSH serum levels are positively associated with HOMA-IR in euthyroid adolescent with PCOS, this relationship seems to be dependent of adiposity.

RESULTS

Linear regression analysis showed that HOMA-IR was positively associated with BMI ($P < 0.0001$), serum TSH level ($P < 0.05$), and FAI ($P < 0.005$). Multivariate linear regression with HOMA-IR as dependent parameter and BMI, TSH and FAI as independent variables showed that only BMI was independently associated with HOMA-IR after adjustment for TSH and FAI.

Table 1. Correlation coefficients between logHOMA-IR and variate predictors in linear regression analysis

Independent variable	r	P
logBMI	0.647	0.000
FAI	0.430	0.004
TSH	0.361	0.022

Table 2. Multivariate linear regression model with logHOMA-IR as dependent variable and logBMI, TSH and FAI as independent predictors (r square of the model = 0,68)

parameter	B	SE	beta	p
logBMI	2.225	0.652	0.730	0,004
FAI	0.003	0.005	0.095	NS
TSH	0.033	0.073	0.080	NS