

ASSOCIATION OF CARRIERS OF *LEPR* Q223R WITH LEVEL OF THYROID HORMONES IN FEMALE ADOLESCENTS WITH OVERWEIGHT AND OBESITY

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Introduction: Hypothalamus is the center of regulation of homeostasis, including energy homeostasis. Data on the relationship of obesity, hyperleptinemia and thyroid dysfunction are discrete, especially in conditions of an ontogenetically determined change in the hypothalamus sensitivity threshold. Previous studies indicate the relationship between hyperleptinemia and polymorphism of the leptin receptor gene (*LEPR*) in obese patients.

Aim: To determine association of *LEPR* Q223R with level of thyroid hormones in female adolescents with overweight and obesity.

Materials & Methods: A total of 114 Caucasian female adolescents was observed (average age 15.80 ± 1.08 years): the main group included 68 girls with overweight and obesity (SDS BMI 2.81 ± 0.64) and the control group included 59 girls (SDS BMI 0.34 ± 0.59). Serum thyroid-stimulating hormone (TSH) and free thyroxine (free T4) levels were measured using commercially available enzyme-linked immune absorbent assay (DBC, Canada) with absorbance microplate reader ELx808 (Biotek, USA). Genomic DNA was extracted from whole blood by commercial kits. Genotyping *LEPR* Q223R was performed using polymerase chain reaction with electrophoresis detection.

Results: TSH level was significantly higher in main group (2.085 ± 1.201 mcED/ml) than in control group (2.055 ± 0.766 mcED/ml) ($p=0.0349$). T4 free level was 12.955 ± 2.495 pM/ml in control group and 13.113 ± 2.980 in main group ($p=0.8672$). In control group, TSH and free T4 levels in carriers of different genotypes of *LEPR* Q223R were: 3.089 ± 4.110 mcED/ml and 11.883 ± 3.000 pM/ml in RR-carriers and 1.250 ± 0.474 mcED/ml 14.267 ± 1.556 in QQ-carriers, respectively ($p=0.0143$; $p=0.0150$). There is no association of R-allele carriers with TSH and T4 free levels in adolescents with overweight and obesity.

Conclusion: Increase of TSH level and normal T4 free level were shown in adolescents with overweight and obesity. This indicates subclinical hypothyroidism. Carrier of the risk R-allele associated with increase of the TSH level in girls with normal weight, but not in girls with overweight and obesity.

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