ASSOCIATION BETWEEN METABOLIC DISTURBANCES AND POLYMORPHISM G-308A OF THE TUMOR NECROSIS FACTOR-ALPHA (TNF-ALPHA) GENE IN CHILDREN

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Summary: TNF-alpha is one of the most important factors in the development and course of inflammation. It is suggested that polymorphism located in the 5'regulatory region of the TNF-alpha gene at position 308 (guanine [G]-adenine[A]) may increase expression of this cytokine in fat tissue and influence on fat mass and insulin resistance.

Aim: We investigated whether the polymorphism G-308A of the TNF-alpha gene may influence obesity, insulin resistance, fasting plasma lipids, serum leptin levels and incidence of metabolic syndrome according to IDF criteria.

Material and methods: The examined group included 124 obese children with simple obesity (72 girls and 52 boys) aged 10-18 years old (mean age 14.6) with SDS of BMI >2.0 The control group consisted of 56 healthy non-obese children (36 girls and 20 boys) aged 11-18 years (mean age 14) with SDS of BMI <1.0. Polymorphism identification was performed in total genomic DNA using PCR-RFLP method.

Results: Carriers of A (AG+AA) allele in obese children were significant more frequent than in control group (OR=2.29, 95% C.I=1.18-4.4, Chi2=6.24, $p<0.05$). The carriers of A alleles showed a higher concentrations of fasting glucose (81.31 +/-10.58 vs. 77.39 +/-10.34; $p<0.05$), but lower values of fasting insulin (15.13 +/-7.29 vs. 19.01 +/-9.48; $p<0.05$), lower values of HOMA index (3.04 +/-1.51 vs. 3.68 +/-1.98; $p<0.05$). In the group of boys carriers of A alleles showed a tendency for lower concentrations of HDL (43.81 +/-12.59 vs. 48.26 +/-11.76; $p<0.05$).The blood pressure and leptin did not differ between obese children with gene polymorphism and wild homozygous. Incidence of the full metabolic syndrome (MetS) according IDF definition was 33% of the children. The presence of the MetS in children with wild homozygous GG and carriers of A allele of TNF-alpha polymorphism gene did not show statistical differences (O.R= 1.38; 95% C.I 0.61-3.12 r2=0.58 NS).

Conclusion: 1. Polymorphism G-308A of the TNF-alpha gene is more common in children with obesity.2. Polymorphism G-308A of the TNF-alpha gene does not seem to be associated with a grade of obesity, insulin resistance, lipid profile, leptin levels and incidence of metabolic syndrome in obese children.4. Additional studies in the pediatric population are needed to validate our findings.