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Investigation of the Role of Lipoprotein a rs10455872 Gene Polymorphism in Childhood Obesity

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Abstract : Childhood obesity is an ever-increasing health problem. The Association of obesity with severe chronic diseases such as diabetes and cardiovascular diseases makes the problem life-threatening. Aside from psychological, societal and metabolic factors, genetic polymorphisms have gained importance concerning etiology in recent years. The aim of this study was to evaluate the relationship between rs10455872 gene polymorphism in the Lipoprotein (a) locus and the development of childhood obesity. This was a prospective study carried out according to the Helsinki Declarations. The study protocol was approved by the Institutional Ethics Committee. This study was supported by Tekirdag Namik Kemal University Rectorate, Scientific Research Projects Coordination Unit. Project No: NKUBAP.02.TU.20.278. A total of 180 children (103 obese (OB) and 77 healthy), aged 6-18 years, without any acute or chronic disease, participated in the study. Two different groups were created: OB and healthy control. Each group was divided into two further groups depending on the nature of the polymorphism. Anthropometric measurements were taken during the detailed physical examination. Laboratory tests and TANITA measurements were performed. For the statistical evaluations, SPSS version 28.0 was used. A P-value smaller than 0.05 was the statistical significance degree. The distribution of lipoprotein (a) rs10455872 gene polymorphism did not differ between OB and healthy children. Children with AG genotype in both OB and control groups had lower body mass index (BMI), diagnostic obesity notation model assessment index (DONMA II), body fat ratio (BFR), C-reactive protein (CRP), and metabolic syndrome index (MetS index) values compared to children with normal AA genotype. In the OB group, serum iron, vitamin B12, hemoglobin, MCV, and MCH values were found to be higher in the AG genotype group than those of children with the normal AA genotype. A significant correlation was found between the MetS index and BFR among OB children with normal homozygous genotype. MetS index increased as BFR increased in this group. However, such a correlation was not observed in the OB group with heterozygous AG genotype. To the best of our knowledge, the association of lipoprotein (a) rs10455872 gene polymorphism with the etiology of childhood obesity has not been studied yet. Therefore, this study was the first report suggesting polymorphism with AG genotype as a good risk factor for obesity.

Keywords : child, gene polymorphism, lipoprotein (a), obesity, rs10455872
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