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INVESTIGATION OF TRANSMEMBRANE PROTEIN 18 (TMEM18) AND NEURONAL GROWTH REGULATOR 1 (NEGR1) GENE POLYMORPHISMS' EFFECTS ON BODY MASS INDEX IN OBESE PATIENTS

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Obesity is a complex disorder which has reached epidemic proportions in many parts of the world. It is collectively determined by genes and environmental factors. Genetic studies have demonstrated a high heritability for obesity and established associations of certain candidate genes and their variations with respect to race, geographical location/country of origin. The subsequent application of genome wide association studies (GWAS) in the last decade have identified more than 50 genetic loci associated with body mass and obesity. Hovewer, functional mechanisms and different ethnic backround datas of these loci are almost naïve with regard to obesity. In this study, previously reported NEGR1 gene *rs2815752* and TMEM18 gene rs6548238 GWAS singlenucleotide polymorphisms (SNPs) were investigated for association in a sample of obesity patients who reside in Afyonkarahisar province. This was a case-control study. Polymorphisms were genotyped in 172 obese patients (men=53 and women=119) with a BMI≥30 kg/m^2 (Body Mass Index, mean: 36.7±5.8) and 77 healthy controls (men=37 and women=40) with a BMI<25 (mean: 21.9±2.2). Genotyping was performed by real-time polymerase chain reaction. Body composition was established with bio-electrical impedance analysis. According to obtained results, distribution of *rs2815752* genotype frequencies in obese group were 53.5% for AA, 37.2% for AG and 9.3% for GG, in control group were 49.4% for AA, 42.9% for AG and 7.8% for GG. G and A allele frequencies in obese patients were 27.9% and 72.1% respectively, in controls 29.2% and 70.8% respectively. Distribution of rs6548238 genotype frequencies in obese group were 59.9% for CC, 35.4% for TC and 4.7% for TT, in control group were 63.6% for CC, 31.2% for TC and 5.2% for TT. T and C allele frequencies in obese patients were 22.4% and 77.6% respectively, in controls 21.9% and 79.2% respectively. There were no significant differences between obese and controls in terms of allele and genotype frequencies of NEGR1 gene *rs2815752* and TMEM18 gene rs6548238 polymorphisms. Also there were no significant differences among obese patients with regard to anthropometric measurements and body composition parameters for *rs2815752* polymorphism. However, several significant differences were found for rs6548238 polymorphism with regard to anthropometric measurements and body composition. These were height (p=0.020), body fluid amount (p=0.017), body fluid percentage (p=0.024), body fat percentage (p=0.006) and fat-free mass (p=0.021). Consequently, there is no association with obesity in our study group for NEGR1 gene *rs2815752* and TMEM18 gene rs6548238 polymorphisms.

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