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Establishing a Genetic Link between Fat Mass and Obesity Associated and Vitamin D Receptor Gene Polymorphisms and Obesity in the Emirati Population

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Abstract : Obesity is a non-communicable disease that is widely prevalent with approximately 600 million people classified as obese worldwide. Its etiology is multifactorial and involves a complex interplay between genes and the environment. Over the past few decades, obesity rates among the Emirati population have been increasing. The aim of this study was to investigate the association of candidate gene single nucleotide polymorphisms (SNPs), namely the fat mass and obesity associated (FTO) gene SNP rs9939609 and Vitamin D Receptor (VDR) gene SNP rs1544410, with obesity in the UAE population. Methods: This is a case-control study in which 414 individuals were enrolled during their routine visit to endocrinology clinics in Abu Dhabi, United Arab Emirates between the period of June 2012 and December 2013. Several biochemical tests and clinical assessments along with a lifestyle questionnaire for each participant were completed at the clinic. Genomic DNA was extracted from saliva samples of 201 obese, 114 overweight and 99 normal subjects. Genotyping for the variants was performed using TaqMan assay. Results: The mean Body Mass Index (BMI) ± SD for the obese, overweight, and normal subjects was 35.76 ± 4.54, 27.53 ± 1.45 and 22.69 ± 1.84 kg/m2, respectively. Increasing BMI values were associated with an increase in values for systolic blood pressure, diastolic blood pressure, HbA1c, and triglycerides. The SNP rs9939609 in the FTO gene was found to be significantly associated with the BMI (p=0.028), with the minor allele A having a clear additive effect on BMI values. No significant association was detected between BMI and rs1544410 of the VDR gene. Conclusions: Our study findings indicate that the minor allele A of the rs9939609 has a significant association with increasing BMI values. In addition, our findings support the fact that increasing BMI is associated with increasing risks of other comorbidities such as higher blood pressure, poorer glycemic control and higher triglycerides.

Keywords : body mass index, FTO gene, obesity, rs9939609, United Arab Emirates
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