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ESTROGEN RECEPTOR 1 (ESR1) GENE POLYMORPHISMS AND OBESITY PHENOTYPES IN A POPULATION OF YOUNG ADULTS

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INTRODUCTION

Obesity is considered a growing serious health problem determined by multiple genetic and environmental factors. Estrogens have been established to play a major role on body weight and adiposity regulation through the estrogen receptor 1 (ESR1) codified by the ESR1 gene located at chromosome 6q25. Recent studies have reported that estrogen protects female mice from becoming obese Thus, we aimed to determine whether genotype and haplotype frequencies of ESR1 polymorphisms were associated with body composition measures in a population of 572 young adults.

METHODS

Five hundred and seventy-two unrelated healthy individuals of Caucasian ancestry (398 (69.58%) females and 172 (30.06%) males, mean age 20. 41±2. 69) were recruited from various academic centres in Granada (Spain). Body weight (kg), FM (g), PFM (%) and LM (g) were measured twice, without shoes and in light dothes, to the nearest 0.11 kg using a body composition analyzer (TANITA BC418MA[®]). A Harpenden stadiometer (Holtain 602VR[®]) was used for height measurement. Saliva samples for DNA extraction were collected from study participants using the OG-500 Collection Kit The *PvuII* and *XbaI* SNPs of *ESRI* were selected as genetic markets based on their previous association with indices of adiposity and/or obesity in candidate gene studies. Genotyping was performed using the Open Array technology.

RESULTS

The mean BMI for the study population was 22.63 ± 3.72 kg/m2. Based on BMI classification, the majority of the subjects in this study (71.5%) were of normal weight (65.7% of male subjects and 74.0% of females). lack А of significant association between genotypes of ESR1 gene polymorphisms and obesity phenotypes after adjustment for confounding factors was shown.

| Table 1. Association of the two SNPs of ESR1 with body composition measures | | | | | | | | | | | | | |
|---|-----|------------|------|-------------|-------|------------|------|---------|------|---------|------|---------|-------|
| Genotype | Ν | Height (m) | | Weight (Kg) | | BMI(kg/m2) | | FM (kg) | | PFM (%) | | LM (kg) | |
| | | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| PvuII | | | | | | | | | | | | | |
| TT | 188 | 1.68 | 0.08 | 64.33 | 13.83 | 22.60 | 3.82 | 13.73 | 7.26 | 22.02 | 8.21 | 50.64 | 10.42 |
| СТ | 265 | 1.66 | 0.08 | 63.38 | 13.14 | 22.65 | 3.89 | 14.50 | 8.24 | 21.98 | 8.43 | 48.85 | 9.05 |
| CC | 119 | 1.67 | 0.07 | 63.66 | 10.41 | 22.68 | 3.18 | 15.08 | 8.78 | 20.72 | 8.28 | 49.19 | 8.13 |
| p value | | 0.804 | | 0.826 | | 0.712 | | 0.365 | | 0.550 | | 0.759 | |
| XbaI | | | | | | | | | | | | | |
| AA | 261 | 1.68 | 0.08 | 63.74 | 13.54 | 22.46 | 3.81 | 13.66 | 7.42 | 20.75 | 8.23 | 50.11 | 10.04 |
| AG | 254 | 1.66 | 0.08 | 63.37 | 12.52 | 22.71 | 3.70 | 14.99 | 8.88 | 22.25 | 8.46 | 48.60 | 8.66 |
| GG | 57 | 1.68 | 0.07 | 65.43 | 10.93 | 23.13 | 3.38 | 14.81 | 6.72 | 22.28 | 8.15 | 50.76 | 9.02 |
| p value | | 0.843 | | 0.405 | | 0.240 | | 0.201 | | 0.177 | | 0.478 | |

P values were determined by ANCOVA test with adjustment for sex and age.

CONCLUSIONS

Our results suggest that polymorphism of the *ESR1* gene does not contribute significantly to the genetic risk for obesity phenotypes in a population of young Caucasian

