RELATIONSHIP BETWEEN THE VAL16ALA POLYMORPHISM OF SOD2 (MANGANESE-DEPENDENT SUPEROXIDE DISMUTASE) AND BIOMARKERS OF OXIDATIVE STRESS AND INFLAMMATION IN UNIVERSITY STUDENTS

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INTRODUCTION: Excessive production of free radicals, associated with inefficiency of antioxidant systems, leads to oxidative stress, which can lead to damage to biomolecules. Among the defenses against FR, we can mention the enzymatic antioxidant systems, such as superoxide dismutase (SOD), catalase and glutathione peroxidase. Manganese-dependent SOD (MnSOD), encoded by the SOD2 gene, presents a single base polymorphism called Val16Ala, resulting from the substitution of the codon GTT (valine) for GCT (alanine), which can alter its conformation and activity. **OBJECTIVE**: To evaluate whether the Val16Ala polymorphism has the capacity to alter markers of oxidative stress and inflammation in college students. **MATERIALS AND METHODS:** This study was approved by CEP-UNIPAMPA (5.854.845) and all participants signed the informed consent form. Blood collection occurred after a 12-hour fast. After processing, serum was obtained and analyses were performed with standard techniques in a spectrophotometer using commercial kits and Elisa methodology. The analyses were performed in duplicate. DNA extraction was performed using the PurelinkTM Genomic DNA mini Kit (Invitrogen) and the Val16Ala polymorphism (rs 4880) was genotyped in StepOne RT-PCR using the TaqMan SNP genotyping assay (Applied Biosystems, California, USA). The results were analyzed using Student's t-test in SPSS and $p<0.05$ was considered significant. **RESULTS AND CONCLUSION**: 244 students (45 men and 199 women) with a mean age of 23.14 ± 4.83 years participated in the study and were divided into two groups, TT genotype (Val/Val) (n=40) and another with TC genotypes (Val/Ala)+CC(Ala/Ala) (n=204). The Val/Val group (I don't know if it was, but I assume) presented lower levels of catalase (p=0.023) and GPx (p=0.020), as well as IL-1B (pro-inflammatory) (p=0.019) and hs-CRP (p=0.028) were significantly higher when compared to the Val/Ala+Ala/Ala group. Thus, the Val/Val genotype of the Val16Ala polymorphism negatively modulated antioxidant defenses and inflammatory markers in the studied sample, indicating the influence of genetic modulation in the inflammatory and oxidative context. Complementary studies may elucidate the role of this polymorphism in the response to toxicological agents that impact human health.

Keywords: MnSOD; Oxidative stress.