Participation of the Ala-9Val Polymorphism of SOD2 Human in Sepsis

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The outcome of sepsis occurs due to influence of environmental and genetic factors besides genes variants whose expression support or not its outcome. Oxidative stress is related to the pathogenicity of sepsis, occurring when there is overproduction of reactive oxygen species associated with inflammation. The objective of this work was to investigate if there is any difference in the redox environment between peripheral blood mononuclear cells (PBMCs) Ala-9Val polymorphism carriers of the SOD2 gene before and after they were challenged with lipopolysaccharides (LPS). The PBMCs were isolated from the blood of 30 healthy humans volunteer by gradient centrifugation (15 volunteer for each allele) and the following assays were performed: antioxidant enzyme activities (Superoxide Dismutase, total and manganese; Catalase; Glutathione Peroxidase), total radical-trapping antioxidant parameter (TRAP assay), non-enzymatic antioxidant capacity (total antioxidant reactivity–TAR), estimation of conjugated dienes (Lipid Peroxidation), the statistical analysis utilized was t Student Test, significance p<0.05. The baseline cells with Ala allele showed a significant increase in CAT and SODtotal activity, as well as increase in TAR when compared with the Val allele. However, Ala allele cells were challenged with LPS, pro-oxidant capacity showed a significant increase when compared with Val allele cells. The CAT activity and lipid peroxidation were increased in the two alleles, and SODtotal activity increases significantly in the Val allele cells. The results presented in this work show that polymorphism participates actively in the cellular redox environment, and his identification is important for a better control of the disease.

Word Keys: Ala-9Val Polymorphism, SOD2 gene, Oxidative Stress, Sepsis

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