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Roles of the lipid peroxidation by-product 4-hydroxynonenal and reductive power in metabolic syndrome

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Abstract

The metabolic syndrome (MetS) is a cluster of three or more risk factors which include high triglycerides, abdominal obesity, high blood pressure, high cholesterol, low HDL, and increased fasting blood glucose. The increase in the prevalence of MetS has been recognized as a public health concern in worldwide. Oxidative stress that has been defined as an imbalance between oxidants and antioxidants in favour of the oxidants, has been associated to metabolic alterations such as metabolic syndrome. 4-Hydroxynonenal (HNE) which results from oxidation of polyunsaturated fatty acyl chains, is one of the quantitatively most important lipid peroxidation products. Thiols are natural reservoirs of reductive power and act as a potent antioxidant molecules. The aim of the study was to determine the serum levels of HNE and total thiol in individuals with MetS and without MetS. The sixty individuals with MetS (mean age 41.88±13.2 years and mean BMI was 35.2±7.0 kg/m²) and without MetS (mean age 30.5±9.4 years and mean BMI was 30.47±5.1 kg/m²) in each group were included to study. Serum total thiol levels were analyzed by spectrophotometrically and HNE levels were measured using Elisa kit. Serum HNE levels were significantly higher in patients with MetS than subjects without MetS (p<0.05). Despite the increased in total thiol levels in patients with MetS, we observed that there was no significant difference between groups. Our results demonstrated that higher levels of lipid peroxidation marker and alteration in total thiol levels may have a role in metabolic syndrome pathogenesis as a consequence of an increased oxidative stress.

Keywords: 4-Hydroxynonenal, total thiol, lipid peroxidation, metabolic syndrome,

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