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REDOX REGULATION AND THERAPEUTIC EFFECTS OF BIO-NORMALIZER

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Bio-normalizer (BN, Sun-O International, Gifu, Japan) is a functional food produced of papaya fruits and some tropical herbs by the yeast and bacterial fermentation. According to chemical analyses, BN is a complex mixture of natural compounds such as Lipopolysaccharides, oligosaccharides, oligopeptides, free amino acids, polyphenols, etc. It has been shown in a number of studies that BN possessed antioxidant, free radical scavenging, and chelating properties in both *in vitro* and *in vivo* experimental systems. Besides that, high therapeutic efficacy and safety of BN have been well documented in clinical conditions. The main goal of the present study was to find the correlation between BN clinical effects and its capacity to regulate the redox balance in human body. Since BN was approved in Russia as a food supplement, several double-blind case-controlled randomized clinical trials have been performed. The positive clinical effect on diabetic patients was shown which well correlated with the improvement in glutathione metabolism, superoxide and nitric oxide production by circulating blood leukocytes, and lipid peroxidation in erythrocytes and plasma. In order to ameliorate the toxic effects of chemo- and radiotherapy, BN was applied to children suffered from acute lympho- and myeloleukemia. Besides effective suppression of clinical symptoms of toxic hepatitis and irradiation-induced encephalopathy, BN administration caused MnSOD and catalase induction and an increase in GSH level in leukocytes. At the same time, the oxygen radical overproduction by white blood cells was reduced to the normal level. Taking into consideration the experimental data on the promoting effect of BN towards the interferon, TNF-α and interleukin-1 production by phagocytozing cells in cultures, the clinical study of patients with virus B and C hepatitis was carried out. The results revealed significant improvement of patients' clinical, biochemical and immunological parameters as well as an increase in interferon-α and γ levels. BN therapy led also to the normalization of impaired prooxidant/antioxidant status in hepatitis patients. On these grounds, we suggested that BN could be regarded as a natural regulator of redox homeostasis in human body. As a consequence, the improvement of cytokine production might occur that in turn would lead to beneficial clinical effects in a number of human pathologies.