

In Vitro Evaluations Regarding Serum Redox Stress Parameters in Investigating Aging & Oxidopathies

Yaşlanma ve Oksidopatilerin Araştırılmasında Serum Redoks Stres Parametreleri: *In vitro* Değerlendirme

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ABSTRACT The balance between the oxidative action of free radicals and the level of antioxidants in a body is essential for life and characterizes a living organism's capacity of resistance to stress. The aim of our study was to evaluate in human subjects, some serum redox parameters such as Apparent Redox Potential (ARP) and Redox Stability Index (RSI) in relation with age, and to correlate them with the subject's global metabolic profile. We also evaluated the endogenous formation of plasma nitric oxide (NO) metabolic-pathway products, as marker for endothelial nitric oxide synthase activity – eNOS, and two lipid peroxidation parameters: susceptibility of erythrocytes and low density lipoproteins to lipid peroxidation - ESP and oxLDL, respectively.

60 patients were selected using admission criteria according to SENIEUR protocol, for immunogerontological studies, and were divided in 3 age categories of study groups: young (30-45 years old); pre-senescent (50-65 years old) and senescent group (66-80 years old). Baseline ARP (ARP0) was evaluated using a 727 Tistand Potentiometer (Metrohm AG, Switzerland), with a combined Pt electrode with internal reference. The RSI was studied as a result of the in vitro action of a mild oxidant 1,4- benzoquinone (BQ); the lower the RSI, the greater the antioxidant capacity of serum.

RSI, so the serum capacity to counteract in vitro an oxidative stress, significantly increases with age. The young group subjects had the lowest RSI, so the highest blood antioxidant capacity. oxLDL significantly increases with age. Significant correlations between oxLDL and redox parameters (RSI) were pointed out in study group patients. Plasma NOS activity significantly decreases with aging.

These results suggest that in senescence the redox homeostasis is altered and the serum capacity to protect against prooxidant factors has a tendency to decrease. This process is accompanied by endothelial dysfunction and will determine a higher susceptibility in oxidopathies appearance.

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Key Words: Lipid peroxidation, redox stress, aging

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