ABSTRACT

Nowadays, the need to simplify methods of determining the redox status of humans is crucial, as oxidative stress has been documented to be linked to several pathological conditions. At the same time, several studies that openly challenge the induction of this condition after intense exercise, make it necessary to examine the body's response to oxidative stimuli, including exercise. In this study, a thorough examination of a new system (Luoxis RedoxSYS), which allows the immediate determination of redox status in human plasma was attempted. The study aimed at identifying the validity of the results provided by this particular diagnostic system in both physiological and pathophysiological conditions. The obtained results were particularly satisfactory in both healthy individuals and patients suffering from Sepsis, Obesity, Metabolic Syndrome, and Type 2 diabetes mellitus. Specifically, there were significant correlations of the results provided by the diagnostic system with those provided by widely used spectrophotometric assays reliably assessing both antioxidant defense levels of an organism, and levels of oxidative damage in biomolecules. Moreover, a significant conclusion of the present thesis is the lack of homogeneity in the redox status of volunteers after intense exercise. Indeed, an interesting feature that has emerged concerns is the existence of an improved redox condition in individuals after an exercise, a situation referred to as "Reductive Stress" in the literature. Assuming that the athletic background of individuals can affect the body's response to the inflammation following intense exercise and consequently their redox status, a large-scale experiment was conducted and the results confirmed the above hypothesis. Finally, we made an effort to examine the effects of post-exercise reductive stress, focusing on the response of Peripheral Blood Mononuclear Cells (PBMCs) to an oxidizing agent. The obtained data suggested that reductive stress is a protective mechanism, at least when followed by an oxidizing stimulus, making it the first work that clearly highlights the beneficial effects of this condition on the organism