

UNOBTRUSIVE HEALTH HAZARD

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OXIDATIVE STRESS

Oxidative stress is a biological mechanism caused by an imbalance between biosynthesis and gathering of oxygen reactive species (ROS) in biological system. If the ability of any biological system to detoxify these oxygen reactive species there will stress. ROS are typically produced as byproducts of oxygen metabolism and can play a variety of physiological roles, including cell signaling. Despite this, environmental stressors such as UV, ionizing radiation, pollutants, heavy metals, and xenobiotics can also produce ROS. Common reactive oxygen species are Superoxide radicals (O_2^-), hydrogen peroxide (H_2O_2), hydroxyl radicals ($\bullet OH$), and singlet oxygen (1O_2) produced during different metabolic pathways. Processes, like protein phosphorylation, activation of several transcriptional factors, apoptosis, immunity, and differentiation, are all dependent on a proper ROS production and presence inside cells that need to be kept at a low level[1]. When ROS production increases, they start showing harmful effects on important cellular structures like proteins, lipids, and nucleic acids. ROS are mainly produced by mitochondria, during both physiological and

pathological conditions, that is, O_2^- can be formed by cellular respiration, by lipoxygenases (LOX) and cyclooxygenases (COX) during the arachidonic acid metabolism, and by endothelial and inflammatory cells. ROS production basically relies on enzymatic and non-enzymatic reactions. Enzymatic reactions able to generate ROS are those involved in respiratory chain, prostaglandin synthesis, phagocytosis, and cytochrome P450 system. Free radicals are generated from both endogenous and exogenous sources. Immune cell activation, inflammation, ischemia, infection, cancer, excessive exercise, mental stress, and aging are all responsible for endogenous free radical production[2].

Signs of oxidative stress[3]:

- Fatigue.
- Memory loss.
- Muscle or joint pain.
- Wrinkles and grey hair.
- Decreased eye sight.
- Headaches and sensitivity to noise.
- Susceptibility to infections.



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Reducing Oxidative Stress[4]:

- Avoid sugar and processed foods while balancing your blood sugar levels.
 - Prevent infections.
 - Allow time for daily stress remedies.
 - Avoid toxins.
 - Promote the production of anti-oxidants.
 - Eat foods that are high in anti-oxidants.
 - Take herbs that are high in anti-oxidants.
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