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To Breathe or Not to Breathe: Oxygen with Two Faces

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Introduction

What is oxygen free radical?

Oxygen is an essential substance for human survival. The percentage of oxygen in our body is about 65%, and tissue cells breathe this oxygen to produce energy. In the past, oxygen, which helps humans to breathe every day, was thought to be beneficial to the body unconditionally. However, several studies have shown that oxygen scum is generated in the process of tissue cell respiration and use and that these oxygen scraps can move freely around the human body and behave violently. These oxygen scraps are called Oxygen Free Radical or Reactive Oxygen Species (ROS) [1].

Differences from oxygen

Oxygen molecules in the air are stable with triplet oxygen, but oxygen free radical is deformed oxygen that changes in oxygen and becomes unstable, causing radical damage and damaging cells [2].

Reactive oxygen species

These modified Reactive Oxygen Species (ROS) include hydrogen peroxide H_2O_2, superoxide ion O_2-, hydroxyl radical •OH, singlet oxygen $^1O_2$ etc. [1].

Roles and Source of ROS

Roles of ROS on body

ROS is the same as both sides of the blade. For example, hydroxyl radicals, who are normally produced by degradation of hydrogen peroxide in the body, play an important role in defending the body by attacking pathogens. On the other hand, oxygen free radical is unstable and capable of oxidizing other substances, that is, it can easily modify other substances. For example, low-density lipoprotein [3], commonly known as bad cholesterol, is oxidized in the blood vessels to provide a basis for arteriosclerosis [4] and further contributes to cardiovascular disease inducers [5]. As such, reactive oxygen has both sides.

Source of ROS

As long as humans do not stop breathing oxygen, reactive oxygen continues to be created in our bodies. Individuals who maintain good health status will make good use of this duality of reactive oxygen. However, chronic stress [6], fried food, excessive exercise [7], unnecessary medication, ultraviolet rays, smoking [8], life-threatening toxins from the surrounding environment, heavy metal exposure, and radiation exposure [9] break the body physiological balance.

Conclusion

ROS management through food and lifestyle

ROS generation is the inevitable fate of humans breathing oxygen. So how do we make reactive oxygen beneficial to our bodies? If you have positive thoughts and regular and balanced eating habits and regular exercise in your daily life, you can stay without worrying about free radical. Since reactive oxygen becomes a harmful substance by oxidizing a substance, it is helpful to take antioxidants in daily life to defend them. That is, foods rich in vitamins A, C, E, flavonoids, polyphenols, selenium, zinc, copper, manganese, iron and folic acid are helpful [10]. In particular, Avoid ingesting easily oxidized foods which are corn oil, margarine, burnt foods, and fried foods etc. Avoid smoking [8] and heavy alcohol drinking [11] with a healthy lifestyle that can survive reactive oxygen. Avoid stress [6]. If stress cannot be avoided, you could overcome and think positively through exercise and hobbies. Avoid overeating and keep health through medical news. Minimize exposure to environmental pollution, air pollution [12], ultraviolet rays, radiation [9], food additives etc. Do not exercise excessively and violently and make sure you do it properly [7]. The body dislikes excessive and understated, and likes moderate.

Approach to the disease caused by ROS

ROS attack with many factors can cause many diseases [13]. First of all, each approach according to the disease is given priority. At the same time, with taking antioxidant-rich foods, your body will be recovered by personalized nutritional supplements, intravenous nutritional therapy and detoxification through taking appropriate functional medicine tests.

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