

Oxidative Stress – How Does it Affect Our Health?

Description

What is meant by the term oxidative stress?

Oxidative stress is the term used to describe an imbalance between the number of [reactive oxygen species \(ROS\)](#) being produced and the body's ability to detoxify them.

What are reactive oxygen species?

Free radicals, or reactive oxygen species, are compounds that are naturally produced by the body as by-products of certain chemical reactions. There are several different types of ROS including superoxide radicals, hydroxyl radicals and hydrogen peroxide. They can be produced both by reactions involving enzymes and those without. These compounds are also naturally created when a person is exercising.

Free radicals can also be produced as a result of environmental factors such as exposure to certain chemicals and other substances including pollutants and cigarette smoke. Being around certain types of radiation is also known to trigger ROS production. For example, the ionising radiation used during radiotherapy cancer treatment and [electromagnetic fields](#) (EMFs) emitted by electronic devices such as mobile phones can have this effect on the body. Ultraviolet radiation from the sun has the potential to cause problems if the skin is not adequately protected.

Do free radicals have any benefits for the body?

When they are kept at suitably low levels, the compounds can actually have a positive impact. For example, they can be used as part of the immune system to help destroy invading pathogens. They can also have a role in intracellular communication in order to help regulate blood flow. To achieve these benefits, while avoiding negative effects, ROS numbers need to be kept under control.

Why does oxidative stress occur?

When ROS are created in too great a number, the body is unable to effectively eliminate the free radicals that are being produced. These then build up in the cells and body tissues.

Since these unstable molecules do not have complete sets of electrons, they steal electrons from nearby surfaces. The tissues that have been affected then have a compromised cell structure and this prevents them from functioning as effectively. Ultimately, this leads to oxidative stress.

What effects does oxidative stress have?

Oxidative stress has the potential to impact on the body both in the short term, and in the long term. These effects can vary from relatively minor complaints to life-limiting, or even life-threatening, medical

conditions. This occurs because oxidative stress has the capability of affecting different types of cells including lipids, proteins and even DNA.

DNA damage is one of the factors that can contribute towards the development of cancer. Oxidative damage has also been found to be one of the major causes of cardiovascular disease (CVD). Several neurological disorders such as depression, Alzheimer's and multiple sclerosis (MS) have been linked to oxidative stress. There have also been links found with inflammatory conditions such as asthma, chronic obstructive pulmonary disease (COPD) and rheumatoid arthritis.

Oxidative damage can also be responsible for problems with the skin such as acne and increased skin ageing and wrinkle formation.

How can oxidative stress be reduced?

The levels of free radicals in the body, and therefore also the levels of oxidative stress, can be kept to a minimum by limiting environmental factors that cause these compounds to be produced. Ways of achieving this could include avoiding smoking, wearing sun lotion and reducing the amount of time spent using electronic devices.

That said, these factors cannot be avoided entirely. To reduce the oxidising effect of EMF, it is possible to use a stabilising device that is designed to cancel out the detrimental impact of mobile phone radiation on the body. In order to counteract ROS production, substances containing molecules known as antioxidants can be taken in.

How do antioxidants work?

Antioxidants counteract the detrimental effect of excessive free radicals by donating some of their own electrons. These electrons then bind to the free radicals, causing them to have a full set of electrons and no longer be unstable. This means that these molecules can be neutralised without stealing electrons from the body tissues and causing damage.

What sources of antioxidants are there?

The body produces its own supply of endogenous antioxidants, though it is also beneficial to take in sources of exogenous antioxidant molecules.

Natural [antioxidant vitamins and minerals](#) include vitamins A, C and E and minerals zinc, copper and selenium. Foods rich in these vitamins and minerals can be incorporated into the diet, or these nutrients could be supplemented if needed.

Fruits and vegetables also contain a group of compounds called flavonoids that work as natural antioxidants. One specific type of flavonoid known as genistein is found in soy products and another type called catechins are found in green tea.

Numerous examples of [scientific research](#) have also shown molecular hydrogen to be an effective natural antioxidant that doesn't have any side effects. It can be taken in through various means such as by drinking water that has been infused with extra hydrogen atoms.

Conclusion

When the body is unable to keep up with detoxifying the volume of free radicals, oxidative stress can occur, contributing towards many health problems. Thankfully, using antioxidants that are produced naturally and included in the diet, it is possible to counteract these effects.

To purchase a portable hydrogen device see below

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