

OXIDATIVE STRESS, HEALTH, AND AGING

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All of us know what stress is because we have experienced it. The actual definition of stress includes a total response to all pressures and demands on a person. It has been described as a feeling or a discomfort and being unable to handle a load imposed on that person. Another definition includes a force or influence, and in physics it means to impose a physical load onto an object. It can also be defined as a state resulting from stress (or load). Oxidative stress is a description applied to what happens chemically in the body in response to external and internal factors caused by the burning of oxygen in our bodies. A simple way to explain this is that when a fire burns, a certain amount of “smoke” is given off. In this case, the smoke is a product of the burning of carbohydrates, fats, and proteins which during the process of burning give off elements known as “free radicals.” These metabolic products given off by the workings of the mitochondria or small elements in the cells are often toxic, and the body has developed ways to sweep away the free radicals which exist. However, because of external influences, certain bad nutritional elements, and even psychological stress, the numbers of free radicals can overload the system which takes away the free radicals. The free radicals act somewhat like an acid would by eroding away DNA, immune proteins, and even living cells of the heart, brain, or other organs. It is important to reduce the free radical load and to improve the body’s ability to perform the antioxidant tasks which it has been assigned.

There is a delicate balance between the stress load and our bodies being able to take care of this amount of free radicals secondary to oxidation. If this stress load is too great, then the body reacts by breakdown of one or more of the systems. It can be a mental, physical, chemical, or even DNA breakdown, all of which can cause either mental or physical problems.

Where does oxidative stress come from? Externally, the environment with pesticides, smoke, ozone, toxic fumes, dust, etc. imposes a load on our bodies. Food eaten acts much the same way, in that our body has to process the free radicals that are generated from food additives, excess hormones, excess chemicals, and also from bad oils such as hydrogenated or trans-fat. Rancid oils and slightly spoiled food can also create the same oxidative stress load. When psychological stress is imposed for a long period of time, it creates certain chemicals including Cortisol, which burns chemicals in the body in a particular way and creates more free radicals. The free radicals from this process can be the same as those from introducing toxic elements into the body.

How do we prevent oxidative stress? The first way is to reduce external stress or to learn how to handle it. Many people find that their jobs are stressful and have imposed too much of a load on their bodies and that they are unable to handle the oxidative stress load, which is resulting from this. By engaging in relaxation techniques such as yoga, tai

chi, or other pathways, they are able to reduce this stress load. Another way is not to eat too much, because excess food generates excess blood sugar and excess secretion of hormones resulting in a higher number of free radicals in the body. We all know that increased heart disease, cancer, Alzheimer's disease, and many degenerative diseases are directly associated with obesity which is the ongoing and end result of excessive food intake. People can live longer on more calorically restricted diets, and it is possible to keep laboratory animals alive 40 to 50% longer on a type of calorically restricted diet with adequate nutrients. It is important to eat good food which is healthy for you (contains antioxidants and nutrients) and not food which is "empty calories" such as sugar and flour and bad fat. Even if you do eat some of the bad products, they should be eaten in small quantities so that the stress load is not too great.

What about "antioxidants" which we hear so much about these days. They are appearing in skin care products, special drinks and juices, and vitamins. People who eat the most fruits and vegetables which contain antioxidants have the least cardiac disease, cancer, and degenerative diseases. Many foods have very high antioxidant levels, and these can be, for example, like blueberries, apples, grapes, ginger, spices, and thousands of other individual food products. Foods with low anti-oxidant capacity include sugar, empty carbohydrates such as pasta and bread, and some fats. Anti-oxidants on the skin such as Vitamin C, green tea, and pomegranate extracts all improve the skin's ability to react against the free radicals caused by exposure to the sun.

As an overview, it is obvious that we are impacted daily by the results of reactive oxidative stress and that we are able to control this to some extent, giving us more vitality, freedom from disease, and long-term better aging. Obviously, just like our diet on a daily basis, it is a constant battle and we must learn about this metabolic enemy so that we can help our body fight this daily accumulation of oxidative stress load which is imposed on us.

A good diet, minimal-to-moderate food intake, good sleep, moderate exercise, and freedom from external stress factors are certainly a big help. Taking antioxidants as supplements or antioxidant food extracts may be helpful as well. Limited exposure to sunshine also decreases the oxidative stress load. Think about all these things and think about the "moderate" life in general and you will have the solution to this problem, which can be a deadly one for humans. You can win this battle, but it's not easy because it involves changing some of our lifestyle habits. Stay focused. You can do it!