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NEWSLETTER

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Antibiotic Therapy

Alters Redox Balance in Gut Microbiome

We hear a lot about the microbiome these days. As a short review, bacteria, viruses, fungi and other microscopic living things are referred to as microorganisms, or microbes, for short. Trillions of these microbes exist mainly inside our intestines and on our skin. Most of these microbes are located in our small intestines, 26 feet of our 30-foot GI tract.

THE GENETIC INFORMATION contained in these bacteria are referred to as the gut microbiome. Although many different types of microbes live inside us, bacteria are the most studied. There are actually more bacterial cells in our bodies than human cells. Essentially, we are more bacteria than human. Most of these bacteria are extremely important for our health, while others can cause disease.

Our digestive tract is the home of 100 trillion bacteria from over 1,000 separate species. This ecosystem of organisms grows on what we eat. The food we consume can be compared to soil in a garden. Food choices determine which bacteria grow. Certain types grow together like thriving plants in a community garden and certain kinds are pathogens that bully and intimidate like weeds. These pathogens are present in part to signal stress, alerting the body there is a problem. Other pathogens lead to inflammation. Science is now showing that bacterial DNA interacts with our DNA to epigenetically switch on and off our body's genes. This activation is vital to assist humans in adapting to environmental changes that help us achieve maximal health.

Recently a foundational study was reported in the on-line publication elifescience.org 2018; 7:e35987. The authors document the impact of consuming antibiotics on the bacteria of the gut microbiome. In this study, authored by fifteen doctors, there was indication that rodents treated with antibiotics showed a disruption of the microbiome redox potential. Redox potential is a measure of the ease with which a molecule will accept electrons, which means that the more positive the redox potential, the more readily a molecule is reduced.

Antibiotics can create stress which shifts the redox potential and causes excessive secretion of redox molecules. This produces excessive oxidative stress on friendly bacteria, which can be exploited by pathogens to then take over the intestinal microbiome. As a result of this shift in equilibrium, the body can react with inflammation, vitamin mal-absorption, internal bleeding, colitis, and even diverticular disease. The key point is that this can be quantitated through actual measurement of the redox potential. It should be noted that the rodents in this study normalized in time after treatment.

In my clinical practice, microbiome dysbiosis, which is an oxidative shift toward disequilibrium, is often the result of antibiotic use or consuming foods which also change the redox potential. Foods like wheat, rice, pasta, white potatoes, and sugar are only needed in times of strife as they

act like a sort of food storage. Conversely, fresh non-processed foods such as vegetables, fruits, meats, beans, eggs, and nuts stimulate growth of friendly bacteria and balance the redox potential. Microbiome balance can also be achieved through consuming stabilized supplements of redox molecules which contribute further to help support equilibrium of our gut microbiome.

In the study reported here, abnormal fecal redox potential measurements were directly related to antibiotic administration as well and decreased friendly bacterial colonization, within hours of administration. Again, the take home message is that we must temporize antibiotic use and seek to maintain a diverse baseline of bacterial species through, diet, probiotic therapies, and supplements which can foster growth. Helpful supplements are omega-3 fatty acids and berberine. Additionally, the novel approach of actually supplementing stabilized balanced redox molecules can activate the standard support measures. It can help realize our full potential to restore and maintain a healthy gut biology and create epigenetic opportunities for our overall health. ■

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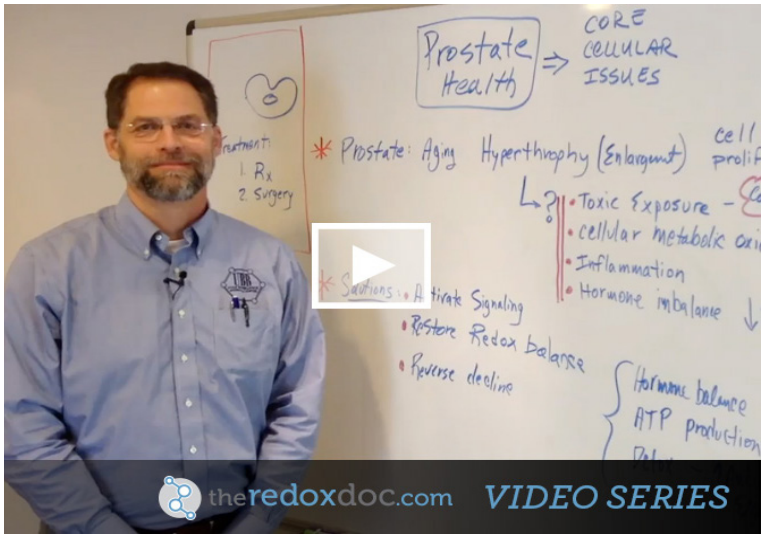

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