Aging: Oxidative Stress and Dietary Antioxidants
Dominick M. Maino, OD, MEd, FAAO, FCVD-A, reviewer

Preedy, V (Ed). “Aging: Oxidative Stress and Dietary Antioxidants”. Academic Press (Elsevier), Waltham, MA. 2014. 301 pages including index. ($94.00-$130 [on Amazon]) Kindle version available for $102.00

This oversized text has 29 chapters, 82 contributing authors, multiple figures and diagrams in each chapter and an index. These chapters include but are not limited to the effects of oxidative stress upon frailty, skin aging, cardiovascular disease, diabetes, and elderly women. Other chapters review the health impact of various diets (vegetarian, etc) and a discussion of spices/herbs, vitamins, tryptophan, melatonin, soy and other supplements. Oxidative stress and depression, Alzheimer’s disease, brain injury, heart disease, hypertension and arthritis are reviewed as well.

Since I have lectured on evidenced based clinical practice and often speak about the science behind the use of antioxidants, diet, and supplements; this particular text was a timely addition to the resources I have available in this area. And ever since I have become officially chronologically enhanced (AKA “old guy” who is eligible for Medicare), a particular interest in aging and the topics discussed in this book have become not only personally important to me, but also for many of the patients I serve.

The first chapter (Oxidative Stress and Frailty: A Closer Look at the Origin of a Human Aging Phenotype) immediately impacts any of us who are aging (this means all of us, of course). This chapter defines oxidative stress as a disturbance in the prooxidant-antioxidant balance leading to oxidative damage and the resultant outcomes of aging including frailty. Up to 25% of those 65 years of age and 45% of those 85 years of age and older are considered frail. Frailty (a state of increased vulnerability with a decreased ability to maintain homeostasis) has been repeatedly linked to an increase in detrimental outcomes above and beyond those expected from aging and disease state alone.

The frailty phenotype (which is nicely explained by figure 1.1) includes insulin resistance, inflammation, sarcopenia (age related loss of skeletal muscle), adiposity (increase in and redistribution of fat), age-related hormone decline, and nervous systems dysfunction. The later results in fatigue, slowed walking speed, a decline in physical activity, weight change/loss and muscle weakness. This breakdown of homeostasis leads to an increase in falls/injuries, acute illness, hospitalization, disability, dependency, institutionalization and finally death. Obviously, oxidation is a topic that should be important to all of us who wish to have an active, happy, disability-free life as we experience our senior years.

About a third of the way into the book, I wished that I had additional degrees in biochemistry, genetics, cardiology and many other sciences from geriatrics to enteral nutrition (i.e. tube feeding). The good news is that our background and training as optometrist does prepare you fairly well for the information within this book.

Since I am an Italian who does a fair amount of cooking using many different spices, chapter 10 really sparked my interest. This chapter discussed the use of herbs and spices as related to aging. Did you know that clove has an insulin enhancing ability; turmeric an anti-inflammatory, anticancer and anti-angiogenic affects and that cinnamon, black pepper, and cumin all appear to have a positive impact on the unwanted effects of aging? Ginger, oregano, gingko biloba, garlic,
red pepper, seaweed, and pennywort may all be useful as an anti-aging agent as well. The research that supports the possible anti-aging effects of these herbs and spices included both laboratory and clinical based studies. (Although not noted in this chapter, basil may also have anti-aging effects.)

Other chapters within this text also discuss the anti-oxidative effects of fruits and vegetables (cherries, bananas, strawberries, apples and pears, as well as rice, white asparagus, lentils). Various vitamins and supplements may decrease bone loss (vitamin C), increase muscle performance (magnesium), decrease depression (gingo biloba, resveratrol [found in red wine]) and melatonin (scavenges free radicals). Vitamins and various supplements have been shown in clinical trials to reduce cardiovascular disease as well.

Aging in humans is usually accompanied by a decrease in brain volume and impairment in cognitive function rather than a loss of neurons within the brain. This process (along with any traumatic brain injury the individual may have experienced) can then promote the onset of Alzheimer's disease (chapter 19). Since 44 million individuals worldwide now live with Alzheimer's disease and up to 135 million individuals will have Alzheimer's disease and dementia by 2050, research in this area and the role of anti-oxidants is critical for all.

This book is made understandable for those of us who do not have a background in biochemistry, genetics and other, perhaps unfamiliar areas, because of the many informative figures, diagrams and photographs. When the text I read resulted in some head scratching on my part, the accompanying figures or diagrams usually brought meaning to the fore.

If you want a better understanding of aging, oxidative stress and overall senior health, I can highly recommend this book to any who are experiencing chronological enhancement and have an interest in this area.

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