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Improvement in Circulation and in Cardiovascular Risk Factors With a Proprietary Isotonic Bioflavonoid Formula OPC-3[®]

Maria R. Cesarone, MD, Andrea Di Renzo, Silvia Errichi, MD, Frank Schönlaue, PhD, James L. Wilmer, PhD, and Julian Blumenfeld, MD

This study investigated the efficacy of isotonic bioflavonoid supplementation, OPC-3 on 61 individuals presenting with risk factors meeting the criteria for metabolic syndrome. Subjects were supplemented with a proprietary isotonic bioflavonoid OPC-3 or placebo over 2 months. Plasma oxidative stress status was significantly lowered by 10.1% with OPC-3. All major cardiovascular risk factors were improved with blood pressure, total cholesterol, and fasting blood glucose lowered. OPC-3 significantly improved endothelial function as evaluated by increased vasorelaxation in reactive hyperemia and enhanced diastolic carotid artery flow. Cardiac

ultrasound scanning revealed a significant increase of left ventricular ejection fraction. Skin microcirculation was enhanced, and better tissue perfusion led to significantly increased transcutaneous oxygen partial pressure and decreased $p\text{CO}_2$. With OPC-3 a dramatic and significant plasma C-reactive protein decrease by 52.1% occurred. Individuals may improve key cardiovascular risk factors by daily supplementation with the bioflavonoid OPC-3 as an important part of a healthier lifestyle.

Keywords: bioflavonoid; OPC-3; metabolic syndrome; isotonic; cardiovascular risk factors; Pycnogenol

Cardiovascular risks and metabolic syndrome represent major health problems in all industrialized nations. Inadequate and poor nutrition in combination with stress and sedentary living have contributed to poor general health, an obesity epidemic, and unprecedented health care costs.¹

The importance of ingesting foods and supplements high in antioxidants is becoming more valued as oxidative stress is being uncovered as a common pathologic mechanism to many chronic and degenerative diseases. Oxidative stress, the damage caused by excessive and uncontrolled reactive oxygen species to proteins, lipids, and DNA, has been implicated as a critical mechanism in the initiation and promotion

of cardiovascular disease, cancer, neurodegenerative disorders, retinopathies, cataracts, and autoimmune diseases, to name a few.²

As Americans are ingesting well below the daily fresh fruit and vegetable guidelines of the National Cancer Institute and the US Department of Agriculture, the use of high-quality supplementation is becoming widespread. Many clinicians are now recommending and offering efficacious antioxidant supplementation more frequently since recognizing the real and deficient eating habits of their patients and the growing science behind oxidative stress and antioxidants.

In recent years, the constituents in fruits and vegetables predominantly responsible for the health benefits have been identified as flavonoids. These molecules are synthesized by essentially all plants as secondary metabolites, providing them with protection from oxidative and microbial damage. More than 4000 structurally unique flavonoids have been identified in plant sources.³ Various efforts have been made to subdivide flavonoids into different

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