The Longwood Herbal Task Force

(http://www.mcp.edu/herbal/default.htm) and

The Center for Holistic Pediatric Education and Research

(http://www.childrenshospital.org/holistic/)

Clinician Information Summary

OLIGOMERIC PROANTHOCYANIDIN COMPLEXES (OPCS)

(Pycnogenols, Pine Bark Extract, Grape Seed Extract)

SUMMARY

Oligomeric proanthocyanidin complexes (OPCs) or pycnogenols are extracted commercially from either grape seeds or maritime pine bark and sold under trade names such as Pycnogenol®. In Europe they are used to enhance capillary stability and lymphatic drainage in diverse conditions; they are widely marketed in the US as a treatment for attention deficit hyperactivity disorder (ADHD). Data from *in vitro* and animal studies demonstrate OPCs' potent antioxidant and vasoprotective effects. Several double blind, placebo controlled trials have found significant benefits of OPCs in preventing and/or treating edema and chronic venous insufficiency. Several studies suggest that OPCs, like bilberry (which contains similar compounds), enhance night vision and recovery from glare. There are no randomized, controlled trials evaluating the effect of OPCs on atherosclerosis, attention deficit disorder, allergies, macular degeneration, diabetic retinopathy or aging skin. There are no reported allergies and no side effects of OPCs that exceed those found with placebo treatment. There are no data on safety during pregnancy, lactation or childhood or adverse interactions with other medications or dietary supplements.

POPULAR USES: Prevention and treatment of varicose veins, venous insufficiency and peripheral edema; atherosclerosis; ADHD; allergies; impaired night vision, macular degeneration and diabetic retinopathy; skin aging; antioxidant

CHEMICAL CONSTITUENTS: Oligomeric proanthocyanidin complexes (OPCs), also known as procyanidolic oligomers (PCOs) and grape seed proanthocyanidin extract (GSPE)

(continued)

SCIENTIFIC DATA

In vitro: OPCs enhance collagen cross-linking and reduce elastin's susceptibility to degradation by elastase in rabbit skin. OPCs have vasorelaxant properties, mildly inhibit angiotensin-converting enzyme, enhance microcirculation and modulate nitric oxide metabolism. In intact rat aortic rings, OPCs relax sympathomimetic-induced contractions in a concentration-dependent manner. OPCs also increase nitric oxide (NO) levels, counteracting the vasoconstrictor effects of sympathomimetics. In retinas from pigs and cows, OPCs provide antioxidant protection against experimentally-induced lipid peroxidation. Procyanidins inhibit platelet aggregation as effectively as aspirin. They specifically inhibit thromboxane formation by intact platelets. OPCs exhibit antioxidant effects more powerful than vitamin C or vitamin E. In cells from immunosuppressed mice, they enhance IL-2 production by mitogen-stimulated splenocytes, decrease production of interleukin 6, and increase the cytotoxicity of natural killer cells.

In animals: In rats, treatment with OPCs for seven days before and after surgery improved peripheral edema significantly compared with untreated controls. In rats, OPCs also helped prevent capillary leaking in the brain. Procyanidin provided antioxidant protection to rat hearts against ischemia/reperfusion damage. In cholesterol-fed rabbits, proanthocyanidin-rich extracts did not affect serum lipids, but provided antioxidant protection against severe aortic atherosclerosis. In rats, OPC supplementation afforded significant protection against experimentally-induced gastric ulcers. In immunodeficient mice, supplementation with pycnogenols significantly improved T- and B-cell function. OPCs provided significant protection against edema in the rat paw model of inflammation.

In humans: At least eight double-blind, placebo-controlled trials have demonstrated significant benefits of OPC products for patients with peripheral edema and/or chronic venous insufficiency. In two French studies in normal adults, OPCs improved night vision and recovery from glare. In experiments on adults who smoked at least 15 cigarettes daily, OPCs were as effective as aspirin in preventing smoking-induced platelet reactivity and aggregation but did not affect bleeding time. In a single-blinded randomized, placebo-

(continued)

controlled cross-over study, those who received OPCs had significantly increased serum total antioxidant activity. Epidemiologic evidence links diets high in OPCs, such as those including red wine, with lower risks of cardiovascular disease, but there are no prospective randomized, controlled trials evaluating the effects of OPCs on prevention or treatment of cardiovascular disease. There are no studies of the effects of OPCs in treating macular degeneration, diabetic retinopathy, attention deficit disorder or signs of aging in skin.

TOXICITY AND SIDE EFFECTS

Side effects: No allergic reactions have been reported. In placebo controlled trials, side effects with short term OPC use have not been reported to be greater than placebo.

Interactions with other medications: None known. Effects on platelet aggregation *in vitro* suggest caution for patients taking anticoagulant medication.

Contraindications: None known. Effects on platelet aggregation *in vitro* suggest caution for patients with bleeding diatheses.

Pregnancy and lactation: No clinical studies.

Pediatric use: No clinical studies.

ADDITIONAL RESOURCES

- HOME: http://www.mcp.edu/herbal/default.htm
- Complete Monograph: http://www.mcp.edu/herbal/opcs/opcs.pdf
- Patient Fact Sheet: http://www.mcp.edu/herbal/opcs/opcs.ph.pdf