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FILE: ▪ Pycnogenol® (*Pinus maritime*)
▪ Retinopathy
▪ Diabetes

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RE: Pycnogenol® Pine Bark Extract Shows Promise in Diabetic Retinopathy

Spadea L, Balestrazzi E. Treatment of vascular retinopathies with Pycnogenol. *Phytotherapy Research*. 2001; Vol 15: 219–223.

This study evaluated if Pycnogenol® affects the progression of vascular retinal disorders (conditions affecting blood vessels in the retina of the eye), including diabetic retinopathy (disease of the retina caused by diabetes). Pycnogenol® (Horphag Research, France) is a patented, water extract from the bark of French maritime pine (*Pinus maritime*). The primary active ingredients are phenolic compounds such as catechin, epicatechin, and taxifolin, as well as flavonoids including procyanidins and proanthocyanidins.

“Pycnogenol has antioxidant and free-radical scavenging activities which are higher than those of green tea extracts, *Ginkgo biloba* and other vegetable extracts,” the authors write. Previous research found that free radicals play an important role in the development of various eye diseases, including retinopathies. Evidence also suggests that antioxidants can be effective at both preventing and treating diseases of the blood vessels in the eye, such as diabetic retinopathy. Studies found that antioxidants can inhibit the processes of neovascularization (formation of new blood vessels) and chronic edema (fluid retention) in the retina. Both of these processes, if left unchecked, can cause a loss of vision.

In this study, there were two phases. In the first phase, which was double-blind, 20 patients were randomly assigned to receive either placebo or Pycnogenol (50 milligrams, three times daily) for two months. In the second phase, which was open-label, 20 additional patients received Pycnogenol at the same dose. A total of 30 patients took Pycnogenol and 10 took the placebo. All the patients had vascular diseases of the retina due to diabetes, atherosclerosis, hypertension, or thrombosis (blood clot) in the central retinal vein. The majority of the patients had either diabetic or hypertensive retinopathy. The average ages of patients taking placebo and Pycnogenol were 53.1 and 59.7 years, respectively.

The effects of treatment with Pycnogenol or placebo were assessed using five different parameters: visual acuity, ophthalmoscopy, visual field, fluoroangiography, and electroretinogram. The visual acuity test showed that on average, placebo-group patients experienced some loss of visual acuity during the two-month study. This indicated that retinopathy can cause rapid deterioration of vision and therefore it needs prompt treatment. In contrast, Pycnogenol-group patients experienced either a slowing of the deterioration of visual acuity or a small improvement in visual acuity. The difference between the groups was statistically significant ($P < 0.05$ for the right eye and $P < 0.01$ for the left eye).

Ophthalmoscopy, performed to examine the ocular fundus (deepest part of the inside of the eye), showed that Pycnogenol-treated patients had significant improvements from baseline to end of treatment. Placebo-treated patients had no improvement. Field of vision testing showed no changes in either group and no differences between the two groups.

Fluoroangiography showed that patients given Pycnogenol had a significant improvement in the blood-retina barrier, with reduction of vascular permeability; this means that there was less leakage from the blood vessels. Placebo patients had no changes during the study according to fluoroangiography.

The electroretinogram also showed significant improvements in the Pycnogenol group but no changes in the placebo group. "The results obtained from this objective functional test clearly demonstrate the efficacy of Pycnogenol," the authors say.

No side effects were reported in either group, and Pycnogenol was well-tolerated. The authors conclude that Pycnogenol led to clinical improvement of retinopathy in this study. They then discuss the ways in which this extract appears to have its effects. "The retina is very sensitive to oxygenated free radicals," they note, and therefore the ability of Pycnogenol to scavenge free radicals may explain its beneficial effects.

In addition, Pycnogenol may have other actions that contribute to its treatment effect. A previous study with rats showed that Pycnogenol reduced leakage from the capillaries, strengthening their resistance. Other studies found that Pycnogenol decreased capillary permeability or subcutaneous edema in venous disorders. Finally, previous studies have suggested that diabetic retinopathy may involve abnormalities in localized production of nitric oxide or reactivity to nitric oxide (a vasodilator). Pycnogenol, like other antioxidants derived from plants, affects nitric oxide activity and therefore may influence diabetic retinopathy via this mechanism.

—Christina Chase, MS, RD

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