RE: Saffron Supplementation Improves Visual Acuity Symptoms of Early Age-related Macular Degeneration


Age-related macular degeneration (AMD) causes the loss of sharp, central vision. The early stages are characterized by the presence of soft yellow deposits under the retina known as drusen and hyper- or hypopigmentation of the retinal pigment epithelium (RPE). Dietary carotenoids have shown protective effects against AMD, as well as antioxidant effects. The Age-Related Eye Disease Study Research Group has found that supplementation with antioxidants may prevent the development of advanced AMD. Crocin and crocetin from saffron (Crocus sativus) are carotenoid derivatives with antioxidant and anti-apoptotic effects. A study in rats has shown that saffron has neuroprotective effects against light-induced photoreceptor degeneration. This double-blind, placebo-controlled clinical trial examined the effect of saffron on the retinal function of patients with the early stages of AMD.

The researchers enrolled 25 outpatients aged 54-85 years at the Università Cattolica del Sacro Cuore in Rome, Italy (12 men and 13 women) diagnosed with bilateral early AMD. Direct and indirect ophthalmoscopy, retinal biomicroscopy, and the presence of primary lesions in the macular area were used to confirm the diagnosis of early AMD. All of the patients had a best corrected visual acuity of 0.3 or better in the study eye, central fixation, normal color vision, and no signs of other retinal or optic nerve diseases. None of the patients were taking medications that affect macular function or prevent carotenoid absorption. A single grader evaluated the photographs of the study eyes following a system based on the classification and grading system for age-related maculopathy and macular degeneration developed by the International ARM Epidemiological Study Group. The researchers performed fluorescein angiopathy in order to confirm the presence of early AMD lesions. The patients were given clinical examinations at baseline and after each 90-day treatment phase, including a visual acuity test with a Snellen chart, fundus examination with direct and indirect ophthalmoscopy, and focal electroretinogram (FERG) testing.

For each patient, the eye with better visual acuity was designated as the study eye. All study eyes had intermediate AMD with 1 or more drusen of at least 63 µm in size (mean: 9 drusen,
range: 4-22 drusen) and/or focal macular hypo- or hyperpigmentation. Out of 25 patients, 6 had focal RPE abnormalities. The patients received either 20 mg/day saffron (n=11) or a placebo (n=4) for 90 days. [Note: No other information is given regarding the saffron supplement, i.e., how it was prepared, if it was standardized, or the identity of the manufacturer.] Following a 15-day wash-out period, patients were crossed over to the opposite treatment for 90 more days. The main outcome measures were FERG amplitude, phase, function slope, and threshold, and the secondary outcome measure was visual acuity. The authors report "satisfactory" compliance and the absence of adverse events. Following treatment with saffron, mean FERG log amplitudes increased compared to baseline levels for all modulation depths (P<0.001), but the effect was most pronounced at intermediate modulation depths (P<0.01). These changes were not found after treatment with the placebo. The mean amplitude increase caused "decrease in both threshold and slope of the FERG versus modulation depth function." The FERG modulation threshold decreased an average of 0.26 log units following treatment with saffron, and it decreased by 0.003 log units after administration of the placebo (P<0.001). FERG slope decreased from baseline levels by an average of 1.6 log units following treatment with saffron and by 0.8 log units following the placebo (P<0.05). There were no clear changes in mean FERG phase after either treatment. Average Snellen visual acuity increased from 0.7 to 0.8 after saffron treatment, and increased to 0.72 after the placebo (P<0.01). Treatment with saffron resulted in visual acuity improvements in 20 of 25 patients, while the placebo caused no changes. The researchers did not find significant changes in ophthalmoscopic appearance following either treatment. In one representative patient, the authors observed FERG amplitude increases following the saffron, but not the placebo phase. These changes caused a reduced FERG threshold.

The authors conclude that treatment with 20 mg/day saffron for 90 days is "associated with statistically significant changes in the macular FERG parameters (amplitude and modulation threshold) in early AMD patients" and an improvement in retinal flicker sensitivity. The mechanism of action and active constituent(s) are not known, but temporary beneficial effects on dysfunctional FERG generators, photoreceptors, and bipolar neurons are proposed by the authors. The authors also conclude that the evidence in this study does not show neuroprotective effects in early AMD patients but does show a small statistically significant effect on visual acuity. Further clinical trials are needed to confirm these results and the mechanism of action. Supplementation information should be included in all future trials.

—Marissa Oppel-Sutter, MS

References


The American Botanical Council has chosen not to reprint the original article.