Could *Crocus sativus* (saffron) be combined with conventional therapies for ocular diseases?

Dear Sir,

Oxidative stress due the continuous contact of ocular tissues with radiation, atmospheric oxygen, environmental chemicals, and physical abrasion has been proposed to play a vital role in diseases such as glaucoma, cataract, uveitis, retrolental fibroplasias, age-related macular degeneration (AMD), and various forms of retinopathy. This offers a prospect for novel approach to their prevention and treatment. Unfortunately, there are no curative treatment options for AMD, and even palliative treatments are few. The utilized therapeutic modalities are associated with various adverse effects, are costly, and only manage the consequence without tackling the cause of the pathology. Hence, many novel options are being investigated. Conventional and newly promising management measures have not accomplished in reversing the outcome of ocular diseases to any radical extent. This has implied researchers to investigate alternative treatment options. Hence, the widespread collections of traditional medicinal knowledge systems from various parts of the world are re-investigated for their healing properties.

Crocus sativus L., commonly known as saffron, is the raw material for one of the most expensive spices in the world, and it has been used in folk medicine for centuries. The major active constituents of saffron are crocin, crocetin, and safranal. There is increasing substantiation that the spice saffron, which contains powerful anti-oxidants, offers protection against neurodegenerative disorders, including AMD and Alzheimer's disease.[1]

Ischemic retinopathy and AMD are the foremost ocular diseases that cause blindness. The etiology of these diseases is due in part to the reduction of blood flow in the retina and/or choroid. Crocin analogs isolated from *C. sativus* L. were found to significantly increase the blood flow in the retina and choroid and to facilitate retinal function recovery.[2] Experimental studies conducted by Ishizuka *et al*. have demonstrated that crocetin prevents ischemia-induced retinal damage through its inhibition of oxidative stress.[3] Results from the experiment by Yamauchi *et al*. suggest that crocetin has protective effects against retinal damage *in vitro* and *in vivo*, indicating that crocetin could suppress increase in caspase-3 and caspase-9 activities following retinal damage.[4] In a randomized clinical trial, it was demonstrated that short-term saffron supplementation improves retinal flicker sensitivity in early AMD.[5]

Saffron extract prevented selenite-induced cataract formation in Wistar rats, probably due to the fortification of antioxidant status, diminution of the concentration of lipid peroxidation, shielding the sulfhydryl groups, and suppression of proteolysis of the lens water-soluble fraction. These findings highlight the anticataractogenic potential of saffron by virtue of its antioxidant property.[6]

These attractive effects propose its presence as a therapeutic agent in future. Though saffron and its constituents have shown multiple useful effects, clinical evidence is still scarce in this regard, and more comprehensive studies with special focus on human clinical trials are required.

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Conflicts of interest

There are no conflicts of interest.

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