Association of Serum Levels of Vitamin C, Carotenoids and Retinol with Cataract

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Introduction

A cataract is an eye disease in which the clear lens of the eye becomes cloudy or opaque, causing a decrease in vision. Although the word cataract to describe this condition has been part of the English language since only the 15th century, the eye disease has been recognized and surgically treated since ancient times. A cataract is a dense, cloudy area that forms in the lens of the eye. A cataract begins when proteins in the eye form clumps that prevent the lens from sending clear images to the retina.

The retina works by converting the light that comes through the lens into signals. It sends the signals to the optic nerve, which carries them to the brain. It develops slowly and eventually interferes with your vision. You might end up with cataracts in both eyes, but they usually don't form at the same time. Cataracts are common in older people.

Over half of people in the United States have cataracts or have undergone cataract surgery by the time they're 80 years old, according to the National Eye Institute. A cataract is a clouding of the normally clear lens of your eye. For people who have cataracts, seeing through cloudy lenses is a bit like looking through a frosty or fogged-up window. Clouded vision caused by cataracts can make it more difficult to read, drive a car (especially at night) or see the expression on a friend's face.

Most cataracts develop slowly and don't disturb your eyesight early on. But with time, cataracts will eventually interfere with your vision. At first, the cloudiness in your vision caused by a cataract may affect only a small part of the eye's lens and you may be unaware of any vision loss. As the cataract grows larger, it clouds more of your lens and distorts the light passing through the lens.

This may lead to more noticeable symptoms. As the cataract continues to develop, the clouding becomes denser and involves a bigger part of the lens. A cataract scatters and blocks the light as it passes through the lens, preventing a sharply defined image from reaching your retina. As a result, your vision becomes blurred. Most cataracts are age-related — they happen because of normal changes in your eyes as you get older. But you can get cataracts for other reasons — for example, after an eye injury or after surgery for another eye problem (like glaucoma). No matter what type of cataract you have, the treatment is always surgery.

Most cataracts are related to aging. Cataracts are very common in older people. By age 80, more than half of all Americans either have some degree of cataract or have already undergone cataract surgery in one or both eyes. By age 95, this percentage increases to almost 100%. A cataract can occur in either or both eyes. Individuals with a cataract in one eye usually go on to develop a cataract in the other eye as well. A cataract is not contagious and cannot spread from one eye to the other or from person to person. Cataracts do not cause the eye to tear abnormally. They are neither painful nor make the eye itchy or red.

Abstract

Nutrients like carotenoids, vitamin E and vitamin C function as antioxidants and hence can influence the process of cataractogenesis owing to their ability to scavenge the free radicals and thereby reduce oxidative damage to lens tissues.To study the association of serum levels of vitamin C, carotenoids and retinol with cataract Hospital-based case control study carried out at the Department of Ophthalmology of a tertiary eye care center of Lucknow240 individuals above 50 years of age were recruited, including 120 cases (Group I) of age-related cataract patients (graded according to LOCSIII) and 120 Age matched Non cataractous controls (group II).

The study subjects underwent biochemical evaluation for vitamin C, Alpha tocopherol, beta carotene and retinol. Group II subjects had significantly higher ascorbic acid, β-carotene, retinol and α-tocopherol levels ($p<0.001$) than Cataractous cases but there was no significant association between type of cataract and any of these parameters ($p>0.05$) or between the different grades of nuclear cataract and the parameters ($p>0.05$)Some essential nutrients like Ascorbic acid, β-carotene, Retinol and α-tocopherol could have a role in the pathogenesis of senile cataract, hence standard cut-off values for different antioxidant micronutrients need to be derived for better evaluation of cataractogenesis.

Key Messages: Essential nutrients like Ascorbic acid, β-carotene, Retinol and tocopherol could have a role in the pathogenesis of senile cataract. Larger population based studies are needed to derive a cut-off value for these factors for better evaluation of cataractogenesis.

Conclusion

Essential nutrients like Ascorbic acid, β-carotene, Retinol and α-tocopherol could have a role in the pathogenesis of senile cataract. Larger population based studies are needed to derive a cut-off value for these factors for better evaluation of cataractogenesis

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