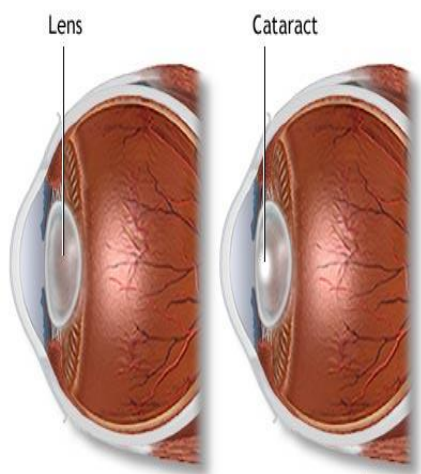


CATARACT AND VITAMIN C

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Cataract is a condition, in which the natural crystalline lens of the eye becomes opaque which causes a gradual, painless deterioration of sight. This results in vision impairment or even a complete loss of vision.

The causes of cataract include,

- Age related metabolic changes of the lens fiber (i.e. Senile cataract),
- Traumatic cataract (i.e. Cataract due to trauma or injury), and

LENS PHYSIOLOGY & PATHOLOGY

The lens is a portion of the eye that is normally clear. It assists in focusing rays of light entering the eye onto the retina, the light-sensitive tissue at the back of the eye. In order to get a clear image onto the retina, the portions of the eye in front of the retina, including the lens, must be clear and transparent. Once light reaches the retina, the light initiates a chemical reaction within the retina. The chemical reaction, in turn, initiates an electrical response which is carried to the brain through the optic nerve. The brain then interprets what the eye sees.

In a normal eye, light passes through the transparent lens to the retina. The lens must be clear for the retina to receive a sharp image. If the lens is cloudy from a cataract, the image striking the retina will be blurry and the vision will be blurry. The extent of the visual disturbance is dependent upon the degree of cloudiness of the lens.

India accounts for approximately 20% of the global burden of blindness, with cataracts being the principal cause. Many population based studies have reported high prevalence rates of cataract in India.

ASSOCIATION OF CATARACT WITH DIETARY VITAMIN C

The lens is made of mostly water and protein. The protein is arranged in a specific way that keeps the lens clear and allows light to pass through it to focus a clear image onto the retinal surface. As we age, some of the proteins may clump together and start to cloud a small area of the lens. This is our understanding of the cause of an age-related cataract. Over time, the cataract may become denser, making it more difficult to see through. A cataract is not a tumor.

Vitamin C is found at concentrations in lens or aqueous of approximately 20 to 30 fold that of the plasma and even higher in the vitreous. Vitamin C acts synergistically with vitamin E, and both vitamins C and E maintain the antioxidant activity of glutathione. Early studies in India were among the first to report that vitamin C concentrations measured in the aqueous of patients undergoing cataract extraction were higher in those with normal lenses compared with those with mature cataracts. However, aqueous vitamin C levels in Indian were considerably lower than those reported for western populations.

The India Age-Related Eye Disease Study that looked at the association of various environmental, socio-economical, nutritional factors with cataract. This large population-based study was conducted in 2 centers in India (All India Institute of Medical sciences, New Delhi in north and Aravind eye hospital, Pondicherry in south India). This study recruited participants from 2 different geographic areas of India, collected information on a wide range of potential confounders including blood sample for antioxidants, accurate measurement of cataract through lens photography. This study has demonstrated that there is a strong inverse association between vitamin C level and cataract

A strong association with deficiency of vitamin C and cataract formation was found in both population. The pattern of an inverse association with vitamin C was similar for different types of cataract in elderly population.

Poor nutritional status with high UV radiation, smoking and tobacco chewing deplete one's essential body's defensive antioxidants especially vitamin C. This low vitamin C status may reflect poor dietary intake but may also reflect genetic polymorphisms. Studies are also underway to establish a correlation between the relevance of haptoglobin polymorphisms for vitamin C status in the lens of older people in India. This study will shed light into the nutritional aspect linking cataract development and it would be a milestone in cataract research in Indian population.