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# A Review of Senile Cataract (*Timira*) and its Management

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## ABSTRACT

Age related cataract is the commonest type of acquired cataract affecting equally persons of either sex usually above the age of 50 years. Senile cataract is almost universal in varying degrees in persons over 70 years of age and is the major cause of global blindness. Special attention should be taken to maintain healthy vision, since the loss of vision partial or complete, disables the person. Importance of vision has been emphasized in our classics by stating *Drishtihi Pradhanatamatvat. Timira* is one among the *Drishtigata Rogas* mentioned by Ayurveda *Acharyas* and it is derived as *Timi Kledane Aardri Bhavaha Iti Yavataha*, which means increased moisture in the visual apparatus. *Acharya Vagbhata* quotes that, *Timira* when neglected becomes *Kacha* and *Kacha* leads to *Andhya* if not treated, *Timira* being dreadful among the diseases of the eye and hence early management is required. Since hydration is a prominent feature involved in the process of cataract formation and the clinical features of cataract like gradual painless loss of vision, polyopia etc. are similar to those of *Timira* and also the surgical management of cataract is similar to *Kaphaja Linganasha Shastra Chikitsa*, the disease *Timira* can be correlated to senile cataract. This article mainly concentrates on *Timira* (senile cataract) and compares the similarities between Ayurvedic and modern management.

**Key words:** Senile Cataract, *Timira*, *Kaphaja Linganasha*, *Shastra Cikitsa*.

## INTRODUCTION

Cataract is one of the common eye disorders encountered in ophthalmological practice, which is caused due to degeneration and opacification of crystalline lens. Clinical features range from mild diminution of vision to loss of vision until only perception of light remains, as the opacification proceeds further until the entire lens is involved. The

word cataract is derived from the Greek word 'Katarraktes' which means 'waterfall'. The view of the objects is similar to that, seen through a waterfall or a water droplet due to clouding of the lens.<sup>[1]</sup>

Cataract is responsible for 50% of blindness in the world. It affects 12 to 15 million persons predominantly adults worldwide. In India, approximately 38 million persons become blind from cataract each year. Timely management is essential to prevent subsequent blindness caused due to it.<sup>[2]</sup> Clinical features as well as management of senile cataract simulates those of the disease *Timira*, which is mentioned as one of the *Drishtigata Rogas* in Ayurvedic classics. This article intends to discuss about *Timira* (Senile cataract), comparing both Ayurvedic and modern methods of management.

## AIMS AND OBJECTIVES

1. To explore the classical Ayurveda and allied literature for understanding the fundamental concept of *Timira* w.s.r to senile cataract.

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- To explore and compare the non surgical and surgical management adopted by both Ayurveda *Acharyas* and modern surgical sciences.

## MATERIALS AND METHODS

Classical Ayurveda text books, modern text books, journals related to senile cataract (*Timira*) and *Shastra Chikitsa* (Surgical procedure) were analyzed for understanding the management of *Timira* (Senile cataract).

## REVIEW OF SENILE CATARACT

Senile cataract is also called as 'age-related cataract, this is the commonest type of acquired cataract affecting equally persons of either sex usually above the age of 50 years. Senile cataract is almost universal in varying degrees in persons over 70 years of age. The condition is usually bilateral, but almost always one eye is affected earlier than the other.<sup>[3]</sup>

Cataract is caused by the degeneration and opacification of the lens fibres already formed, the formation of aberrant lens fibres or deposition of other material in their place. The loss of transparency occurs because of abnormalities of lens proteins and consequent disorganization of the lens fibres. Any factor, physical or chemical, which disturbs the critical intra and extra cellular equilibrium of water and electrolytes or deranges the colloid system within the fibres tend to bring about opacification. Aberrant lens fibres are produced when the germinal epithelium of the lens loses its ability to form normal fibres.

Biologically, three factors are evident in the process of cataract formation. In the early stages of cataract, particularly the rapidly developing forms, hydration is a prominent feature so that frequently actual droplets of fluid gather under the capsule forming lacunae between the fibres, and the entire tissue swells (intumescence) and becomes opaque. To some extent, this process may be reversible and thus opacities formed may clear up. The second factor is denaturation of lens proteins. If the proteins are denatured with an increase in insoluble proteins, a dense opacity is produced, a process which is irreversible; opacities thus constituted do not clear

up. Such an alteration occurs typically in the young lens or the cortex of adult lens where metabolism is relatively active. It is rarely seen in the older and inactive fibres of the nucleus. Here the usual degenerative change is rather of third type, one of slow sclerosis. Clinically, when the first process is predominant the condition is called a soft cataract and third is described as a hard cataract.<sup>[4]</sup>

Risk factors affecting senile cataract include ageing, diabetes, hypertension, excessive intake of alcohol, excessive sunlight exposure, hereditary, overweight, smoking, steroids and dietary factors. The common symptoms are glare or intolerance to bright light, unocular polyopia, coloured halos, black spots, image blur, distortion of images, misty vision and loss of vision.<sup>[5]</sup>

## Management of cataract

Treatment of cataract essentially consists of its surgical removal and nonsurgical measures like prescription of glasses to improve vision, adequate control of diabetes mellitus etc. have been mentioned till surgery is taken up. In the present era, surgical procedures which are commonly employed are manual small incision cataract surgery (SICS) and phacoemulsification surgery which are the techniques of extracapsular cataract extraction.

## Review of Timira

*Timira* is one among the *Drishtigata Rogas* and is mentioned as a serious vision disturbing disease in Ayurvedic classics. It is derived as *Timi Kledane Aardri Bhavaha Iti Yavataha*,<sup>[6]</sup> which means increased moisture in the visual apparatus.<sup>[7]</sup> *Kacha* and *Linganasha* are the successive stages of *Timira* where in the patient experiences blurred vision and other visual disturbances and if *Timira* is not treated properly gradually it leads to *Kacha* and neglecting *Kacha* will end up in *Linganasha* (Complete loss of vision).<sup>[8]</sup>

## Samanya Nidana and Samprapti

The common etiological factors responsible for *Timira* are *Ushnabhi Taptasya Jalapravesha*, *Agni Suryadi Tejasam Avalokana* (seeing objects far), *Swapna*

*Viparyaya* (sleeping during day time and awakening at night), *Samrodhana* (weeping), *Kopa* (anger), *Shoka* (grief), *Abighata* (injury to eyes), *Dhooma Nishevana* (exposure to smoke), *Madhyapana* (consumption of alcohol) and consuming *Pitta Prakopaka Aharas* like *Katu Ahara*, *Amla Ahara*, *Masha*, *Kulatha* etc.<sup>[9]</sup>

Indulgence in these *Achakshusya Nidanas* leads to vitiation of *Doshas* with the predominance of *Pitta Dosh*, which spread upwards through the *Siras* and get localised in *Patalas* of *Drishti* leading to *Timira*<sup>[10]</sup> which is characterized by vision disturbances.

### Lakshanas of Timira

When aggravated *Doshas* get localised in the *Prathama Patala*, person sees all objects hazy.<sup>[11]</sup> When *Doshas* invade the second or *Dwitheeya Patala*, vision becomes more deranged. The person sees flies, mosquitoes, hairs, nets, circles, flags, mirage, rings, different movements of stars, rain from the sky, darkness and will not be able to see hole of the needle though makes great efforts.<sup>[12]</sup> In *Thritheeya Patalagata Timira* patient sees objects as though combined, when localised in the centre, he finds one object as two, two objects as three and when *Doshas* are moving from place to place he sees one object as many.<sup>[13]</sup> In *Chathurtha Patalagata Timira*, i.e. when *Doshas* invade the fourth layer, sight is obstructed totally. This disease is called *Linganasha*, in this disease *Tamas* (darkness) envelops the person but still is able to see the moon, sun, stars, lightings etc. In *Kaphaja Lingansaha* (mature cataract) the *Drishti Mandala* becomes thick, smooth, white like *Shanka*, *Indu*, looks like water droplet on leaf of lotus. This is also known as *Neelika* and *Kacha*.<sup>[14]</sup>

### Sadhyasadyata

*Timira* which is situated in the *Prathama Patala* and has not produced discoloration is curable, situated in the *Dwitheeya Patala* and which has become coloured is curable with difficulty. *Timira* of the *Thriteeya Patala* is said to be relievable only.<sup>[15]</sup> *Kaphaja Lingansaha* (mature cataract) is said to be *Shastra Sadya* (curable with surgery) and all other types of *Linganasha* being incurable.

### Samanya Chikitsa

Include *Snehana*, *Rakta Mokshana*, *Virechana*, *Nasya*, *Anjana*, *Murdha Basti*, *Basti Kriya*, *Lepa*, and *Seka* and suitable administration of these therapies helps to eliminate particular *Doshas* involved in *Timira*.<sup>[16]</sup> Ghee preparations like *Jeevantyadi Ghrita*, *Mahatriphala Ghrita*, *Triphala Ghrita*, *Drakshadi Ghrita*, *Patoladi Ghrita* etc. and *Anjanas* like *Vimala Varti*, *Drishtiprada Varti Anjana*, *Chandrodaya Varti*, *Kachayapana Anjana* etc. have been mentioned in the *Chikitsa* of *Timira*.

### Indications and contraindications for Sastra Chikitsa

Acharyas have explained *Sastra Chikitsa* for *Kaphaja Lingansaha* (mature cataract)

#### Indications<sup>[17]</sup>

1. *Sujatam* (Fully ripened or matured cataract)
2. *Niprekshyam* (Complete loss of vision)
3. *Kaphotbhavam* (which is of *Kapha* origin)

Cataract with the following complications should be avoided before surgical intervention.<sup>[18]</sup>

1. *Avaratki* (Pupillary circle appears like whirlpool, hyper-reactive, of reddish white colour)
2. *Sharkara* (Where *Linganasha* - cataract appears like that of coagulated milk i.e. Calcified cataract)
3. *Rajimati* (When cataract's anterior surface is seen with linings i.e. anterior capsular calcification or hard cataract)
4. *Chhinanshuka* (Pupil is irregular, with tears, charred coloured and painful - anterior uveitis and posterior synechia)
5. *Chandraki* (Pupillary area reflects off - white color and its shape is like that of moon;. Cataract with retinal detachment)
6. *Chhatrki* (The pupillary area or cataract is multicolored like that of mushroom i.e., posterior segmental pathology)

### Contraindications

#### According to pupillary appearance<sup>[19]</sup>

1. *Ardhendu* (Half moon shaped pupil - posterior subluxated lens)

2. *Gharmambhu* (Drop of sweat - anterior dislocation of lens)
3. *Bindhu Muktakruti* (Pearl shaped - shrunk lens)
4. *Sthira* (hard)
5. *Vishama* (Irregular shaped)
6. *Rajiman* (Having streaks - calcified)
7. *Tanu madhye* (Thin from the centre)
8. *Bahuprabha* (Multicolored)
9. *Sarujo Salohita* (Painful or red eye)
10. *Asanjata* (Immature cataract)
11. Patients suffering from: *Thrishna, Kasa, Peenasa, Ajeerna, Vamana*, diseases of *Karna, Akshi* and *Shira*, patients contraindicated for *Siravyadha* and who is *Bheeru* (fear and apprehension for surgery).<sup>[20]</sup>

### SHASTRA KARMA<sup>[21]</sup>

#### Poorva Karma

In a weather which is neither too hot nor too cold, patient is subjected to *Snehana* (oleation) and *Swedana* (sudation) therapies. He should then be made to sit and positioned properly after which he should be asked to fix his gaze towards his own nose continuously.

#### Pradhana Karma

Surgeon should hold a *Yavavaktra Shalaka* (barley-shaped *Shalaka*) in between thumb, middle finger and index finger of his right hand and should open the eyes and puncture the eyeball properly with confidence towards the temporal canthus avoiding two parts of the white of the eye from the cornea. The puncture should be made neither too high nor too low, nor at the sides and saving the network of veins it should then be directed towards the natural orifice. Surgeon should operate with his right hand on the left eye and with his left hand on the right eye. Proper incision is recognised by the production of a typical sound and by the out flow of a drop of liquid (aqueous humor).

As soon as the puncture has been done, the *Shalaka* should be held firmly in proper position while the eye

should be irrigated with human milk and fomented with *Vata* pacifying leaves from outside irrespective of *Dosha* being stable or mobile. Then the lens should be punctured and scraped with the point of the *Shalaka* and the patient should be made to blow out violently the *Kapha* which has accumulated in the lens after closing the nostril of the opposite side.

When the *Drusti* becomes as bright as the sun in a cloudless sky and when there is no pain, it should be regarded as properly scraped. In a case of failure to expel the *Doshas* or in case the *Doshas* reappear therein, the whole process from oleation to puncturing should be repeated.

#### Paschat Karma

When the patient is able to visualise objects, the *Shalaka* should be withdrawn slowly. The eye should be lubricated with *Ghruta* and bandaged with cloth. Thereafter the patient should be made to lie supine in room free from disturbing agencies like dust, smoke, wind etc. and patient should avoid *Udgara* (belching), *Kasa* (coughing), *Kshavathu* (Sneezing), *Shteevana* (Spitting), *Utkampana* (Shivering) during the period. The subsequent regimen is similar to what has been enjoyed for one who has undergone internal oleation therapy.

#### Post - operative complications and their management

The main complications of *Shashtra Karma* are redness (*Raga*), inflammation (*Shopha*), new growths (*Arbudha*), sucking pain, bubble like projections, squint, *Adhimadha* etc.<sup>[22]</sup>

Management of complications includes *Lepas* and *Seka*. *Lepa* prepared with different combination of drugs including 1) *Durva, Yava, Gairika* and *Sariva* paste with ghee 2) *Sarshapa* and *Tila* macerated with the juice of *Matulunga* 3) *Kheeraparni, Sariva, Tejapatra, Manjishta, Madhuyasti* with goats milk.<sup>[23]</sup> The drugs used for *Seka* preparation includes 1) Goats milk boiled with *Rodhra, Saindhava, Mrudvika* and *Madhuka* 2) *Madhuka, Utpala, Kushta, Draksha, Laksha*, and *Sita*.<sup>[24]</sup>

## DISCUSSION

Owing to the similarities found in etiopathogenesis, clinical features and also in surgical approach, *Timira* can be correlated to senile cataract. *Kacha* (immature senile cataract) and *Linganasha* are the successive stages of the disease *Timira* and only *Kaphaja Linganasha* (mature cortical cataract) is said to be curable surgically.

Excessive exposure to sunlight, alcohol, smoking and dietary factors are the common etiological factors found in both cataract and *Timira*. Hydration is one of the factors involved in cataractogenesis which is seen even in *Timira* (*Timi Kledane Aardri Bhava*). Gradual painless loss of vision depending on different stages of maturity and visual disturbances like misty vision, polyopia, black spots in front of the eyes are the common symptoms found in both of these diseases.<sup>[25]</sup>

*Nidana Parivarjana* or avoiding the cause is the best method of treatment modalities found in Ayurvedic classics which is found even in modern ophthalmology text books which suggest that removal of irradiation (infrared or x-rays) and cataractogenic drugs like steroids etc. may delay cataractogenesis.<sup>[26]</sup>

Inflammatory conditions of the eye ball, systemic diseases like respiratory tract infections and other infections of the body are the common contraindications for surgery found in both sciences.

*Kaphaja Linganasha Shastra Chikitsa* resembles extra capsular small incision cataract surgery. Puncturing at *Daivikrita Chhidra* leaving 2 parts from the cornea shows that it is a very small, temporal scleral incision. Scraping the lens is similar to anterior capsulotomy and blowing the nose by closing the opposite nostril was the method adopted to remove the cortical matter.

*Daivakrita Chhidra* (Key hole) which is the junction of medial 2/3rd and lateral 1/3rd of the area between limbus and outer canthus in interpalpebral spaces, should be 6mm from limbus in temporal interpalpebral area and it corresponds with pars plana, the site which is least vascular and devoid of

retinal tissue and also preferred site for intra ocular (posterior segment) approach to the eye ball.<sup>[27]</sup>

Postoperative care mentioned in Ayurvedic classics like avoiding prone position, taking care of sneezing, coughing etc. is similar to postoperative care of cataract surgery. Incision related complications during surgery are mentioned in both the classics. Complications like postoperative anterior uveitis, endophthalmitis (*Raga, Adhimandha*), cystoids macular oedema (*Shopha*), epithelial ingrowth and fibrous down growth (*Arbudha*) are common in Ayurvedic as well as modern classics. Posterior capsular opacification is one of the common complications of cataract surgery which is mentioned as reappearance of *Doshas* (after cataract) in Ayurvedic classics an account of *Murdhabhigata, Vyayama, Vyavaya, Vamana, Murcha, Kopa* and also when an immature cataract is pierced. Detailed description regarding selection of patient, preoperative, operative, postoperative procedures and management of complications in Ayurvedic classics shows systematic approach of ancient surgeons and also utmost care taken during surgery.

Complications of cataract surgery are many, which gives a scope for pharmacological intervention for prevention. *Acharya Shusruta* has stressed upon early management of *Timira*, so that the severity of the disease can be avoided. *Kachayapana Anjana* mentioned by *Acharya Vagbhata* for delaying the progress of *Kacha* shows that *Linganasha* (mature or hypermature cataract) causing loss of vision can be prevented. Various types of *Ahara* like *Purana Ghrita, Triphala, Shatavari, Patola, Mudga, Yava* and prophylactic regimen like *Anjana* (collyrium application), *Nasya* (nasal medication), *Padabhyanga* (foot massage with oil), *Netra Prakshalana* (eye wash), palming etc. as a part of *Dinacharya* mentioned in Ayurvedic classics can be adopted for prevention of *Timira*.

Vitamin A, C, E, beta carotene, flavonoids and minerals like zinc present in *Chakshushya Ahara* having antioxidant activity, act as free radical scavengers and therefore prevent degeneration of lens fibres.<sup>[28]</sup>

Anticataract activity of herbal drugs like *Amalaki*, *Triphala*, *Vasa*, *Shigru*, *Guduchi*, *Haridra*, *Tulasi*, *Palandu* etc., due to antioxidant potential of their phytoconstituents, has been proved in many of the research works. Chief among them is *Triphala*, which is *Chakshushya* and has been indicated in *Timira* in various forms. *Triphala* is rich in polyphenols and tannins. By converting reactive oxygen free radicals to non-reactive products, polyphenolic contents in *Triphala* are responsible for the antioxidant and radioprotection ability.

### CONCLUSION

Cataract is the major cause of global blindness and the best way of managing it is by prevention. Prevention can be achieved at different stages, 1) Primary prevention - Prevention of cataract occurring in the first place. 2) Secondary prevention - Prevention of vision loss after the occurrence of cataract, which includes, arresting progression of cataractogenesis to prevent further vision loss and timely surgery if the maturity has already occurred for better vision and to avoid complications of hypermaturity. Though the surgery is now safe and successful in the large majority of cases, it is not without its inherent problems and potential complications. Prophylactic measures for *Timira* mentioned in Ayurvedic classics along with *Nidana Parivarjana*, *Dinacharya* and suitable *Kriyakalpas* will prevent age related eye diseases like cataract and will also delay its progression. These measures will no doubt contribute to reduction in percentage of global blindness and achievement of vision 20-20.

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