A REVIEW ON AYURVEDIC MANAGEMENT OF KERATOCONUS

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INTRODUCTION
Keratoconus is a non-inflammatory bilateral ectatic condition of the cornea leading to defective vision. This may result in blurred vision, double vision, nearsightedness or myopia, astigmatism and light sensitivity. In Ayurveda there is no direct reference for keratoconus, based on symptoms it can be considered as timira. Timira included under drustigata roga which further leads to Linganasha as its complication, this can correlate to advanced condition of keratoconus. Considering the symptoms and dosha dushya involvement Vatahara and Brumhana line of treatment in the form of tarpana and pindi is more beneficial in keratoconus.

KEYWORDS: timira, linganasha, keratoconus, astigmatism, brumhana, vatahara.

ABSTRACT
Keratoconus is a disorder of the eye which results in progressive thinning and bulging of the cornea. This may result in blurred vision, double vision, nearsightedness or myopia, astigmatism and light sensitivity. In Ayurveda there is no direct reference for keratoconus, based on symptoms it can be considered as timira. Timira included under drustigata roga which further leads to Linganasha as its complication, this can correlate to advanced condition of keratoconus. Considering the symptoms and dosha dushya involvement Vatahara and Brumhana line of treatment in the form of tarpana and pindi is more beneficial in keratoconus.

INTRODUCTION
Keratoconus is a non-inflammatory bilateral ectatic condition of the cornea leading to defective vision. Etiopathogenesis: it is not clear. Various theories proposed so far label it as developmental condition, degenerative condition, hereditary dystrophy and endocrine anomaly. Symptoms:
- Blurred vision,
- Frequent changes of glasses prescription or vision that cannot be corrected with glasses.
- Symptoms of keratoconus generally begin in late teenage years or early twenties, but can start at any time.

Other symptoms include:
- Increased light sensitivity
- Difficulty driving at night
- A halo around light and ghosting (especially at night)
- Eye strain
- Headache and general eye pain
- Eye irritation
- Excessive eye rubbing.

On the basis of previous research work, keratoconus can be considered as Timira and also supporting to this above statement, Vataja Timira Lakshana like vyaviddha darshana (the straight line of the object appears to be curved), avila darshana (blurred vision or hazy vision), Chandra, deepadya anekatvam (the luminous objects like moon, lamp are appears to be multiple) are present, the same symptoms are observed in keratoconus disease. Considering these symptoms Vataja Timira can be correlated with the keratoconus.

Signs:
- Window reflex is distorted.
- Placid disc shows irregularity of the circle.
- Keratometry depicts extreme malalignment of mires
- Photokeratoscopy reveals distortion of circles.
-Slit lamp Examination: may shows thinning and ectasia of central cornea, opacity at the apex and Flescher’s ring at the base of cone, folds in descemet’s and Bowman’s membranes.

-Nipple cone (<5mm) steep curvature
-Oval shape (5-6mm) ellipsoid shape
-Oval cone (>6mm) globe like

**TREATMENT**

Spectacle correction may improve vision in very early cases. However, later in the course of the disease falling vision may not be corrected by glasses due to irregular astigmatism.

Contact lenses: Rigid gas permeable usually improves the vision in early cases. Intrastromal corneal ring are reported to be useful in early cases. Corneal collagen cross linking with Riboflavin (C3R) may slow the progression of diseases. Keratoplasty may be required in later stages. Deep anterior lamellar keratoplasty (DALK) or penetrating keratoplasty (PK) may be performed.

General treatment for timira is gratapana, Nasya and other Shodhana karma, Siravydha, Anjana, tarpana, Pindi and other kriya kalpas.

Vataja Timira treatment: Ghritapana-Dashamula ghrita used for pana. Nasya karma with sthiradi ganasiddha taila, madhuradi ganasiddha taila etc. For Anjana- vasadyanjana, saindhavadi putapaka anjana etc.

If timira is not treated in time it leads to linganasha, it is better to intervene at the earliest to arrest the further progression of disease. Here considering the concept of vata vrudhi in timira the treatment should be vatahara and Bruhmana in the form of Tarpana and Pindi are more appropriate.

**DISCUSSION**

In Ayurveda, vata is responsible for formation of normal body parts. Here in this concept vitiation of vata can be understand in different view, if Vayu in garbhavasta gets vitiated due to dauhrid avamana leads to vikrutakshi and Krishna mandala is originated from vayu Mahabhuta, any defect in function of vata leads to Krishna gata roga. While describing sadyaasadya of kshata shukra, outer part of cornea is mentioned as twaka. So, keratoconus is considered as twakagata vata, described by charaka which may be Beeja Janya. Based on signs and symptoms it holds good with Vataja timira lakshana. Same etiopathology get in contemporary science here also there is no exact cause for keratoconus.

Here thining of cornea is mainly due to the vitiation of vata which leads to progressive myopia and astigmatism. Based on the symptoms of keratoconus, this can correlated to vataja timira.

Considering the dosha involvement the treatment should be vatahara. In this disease sthanika treatment like tarpana and pindi works good.

**Action of tarpana**

Tarpana13 exerting direct pressure up on the cornea, there may be changes in the refractive index of the cornea and ghrita has the quality of transpassing into the minute channels of the body, it enters deeper layer of the dhatus and cleans the every minute part. The lipophilic action of the grita facilitates the transformation of the drug to the target organ finally reaches the cell because the cell membrane also contains lipids. The corneal epithelium is permeable to lipid soluble substances; moreover the
medicine used for *Tarpana* is mainly *Ghrita*. *Ghrita* has high levels of antioxidants which can reduces the damage of thinned cornea by allowing more tissue contact time and bioavailability of the drug from the corneal surface\(^{14}\).

*Tarpana* is indicated in *Timira*\(^{13}\) the commonly used *Ghrita* yogas are *jeevantyadi Grita*, *Triphala Grita*, *Mahatriphala Grita*, *Shatavaryadi Grita*. *Jeevantyadi grita* has high levels of antioxidants, which reduce the oxidative stress and damages of thinned out cornea. It helps in bringing down the corneal protrusion by *dosha shamana* and mechanical pressure\(^{2}\).

In contemporary science C3R and INTACS is advice to strength the stroma tensile and flatten the central cornea, but there is no assurance of cure as their methods are not without complication.

**Action of pindi**

In *Pindi*\(^{15}\) medicine is absorbed through the skin of lids and due to heat of pindi local temperature is increased resulting in vasodilatation\(^{16}\) By practice the *Pindi* can advice to overnight, that will help to flatten the corneal curvature by its mechanical pressure and strengthen the cornea by medicine effect. *Pindi* is incated in *Shota* and *Kandu* the specific drugs like *Sunti* (*Zingiber officinale*) and *Nimbadala* (*Azadirachta indica*) should be pasted in hot water with little of *Saindhava* will help in all the inflammatory conditions of eye\(^{17}\).

In contemporary science contact lenses are advised to correct the myopia and astigmatism, aspheric lenses with high eccentric value helps to flatten the cornea quicker compare to other lenses the main effect of the contact lenses is to provide a best vision to keratoconus patient, the same effect get by *Pindi* procedure.

**CONCLUSION**

In contemporary science there is no way to predict how it will progress. Regular usage of contact lens may cause infection and corneal ulcer. Laser is also not proper treatment for keratoconus. The aim of therapeautic approach is slowdown the progression of diseases and strength the collagen fibers to avoid the further bulging by *Vatahara* and *Brumhana chikista*.

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