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# A Case Study on *Vataja Timira* w.s.r. to Keratoconus

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## ABSTRACT

According to Ayurveda, *Vata* is responsible for formation of all body parts. *Vayu* is said to be *Sarva Dhatu Vyuhakara* and *Kartagarbhakritam*. It means that *Vayu* is responsible for the regular function and amount of *Dhatus* in body. In Ayurveda there is no direct reference of keratoconus, based on the symptoms it can be considered as *Vataja Timira*. This can be correlated to advanced condition of keratoconus, considering *Dosha* involvement *Vatahara* and *Bruhmana* line of treatment in the form of *Nasya*, *Tarpana* and *Pindi* is more beneficial in keratoconus.

**Key words:** *Vataja Timira*, *Keratoconus*, *Astigmatism*, *Nasya*, *Tarpana*, *Pindi*, *Vatahara*.

## INTRODUCTION

Keratoconus is an eye disease that is characterized by thinning and steepening of the cornea. This is the front surface of the eye and the most important focusing element of the vision system. In patients who have keratoconus their cornea is cone shaped.

The name keratoconus is derived from the Greek word for cornea (*kerato*) and cone shaped (*conus*). Keratoconus results in visual distortion often results in visual distortion often not corrected by traditional glasses. The thinning and steepening of the cornea causes the front surface to become progressively more irregular in shape. The corneal surface irregularity is what induces the distortion and blurriness of vision experienced in keratoconus.<sup>[1]</sup>

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## Prevalence

- The reported prevalence of keratoconus varies widely depending upon the geographic location, diagnostic criteria used and cohort of patients selected.
- The prevalence in studies can range from 0.3 per 1,00,000 in Russia to 2,300 per 1,00,000 in Central India (0.0003% - 2.3%). The first population based study was done by Hofstetter using a placido disc and he reported an incidence of 600 per 1,00,000. The most commonly cited prevalence is 0.054% in Minnesota, USA by Kennedy et.al., who used by movement on retinoscopy and keratometry for diagnosis.
- In Central India, the prevalence of keratoconus was studied based only on the anterior corneal power obtained by keratometry. Prevalence of keratoconus defined as a corneal refractive power  $\geq 48$  D was 2.3%. However the prevalence dropped to 0.6% using a cut off power  $\geq 49$  D and 0.1% using a cut off  $\geq 50$  diopter.
- Family history of keratoconus has been found to be very variable and a high prevalence of keratoconus in a sample population can change the reported rate of a positive family history. It varies between 6% and 10% in most studies, the US Collaborative Longitudinal Evaluation of keratoconus study reported a rate of 13.5% and a

study from Israel where the prevalence is high, reported a rate of 21.74%.

- Keratoconus usually occurs bilaterally but asymmetry is common. In a larger series, 14.3% had unilateral disease. Although unilateral cases do exist, their frequency might be even lower than reported. If appropriate diagnostic criteria and examination techniques that detect very early keratoconus are used.<sup>[2]</sup>

### Definition

Keratoconus is a non-inflammatory bilateral ectatic condition of cornea on its axial part. It usually starts at puberty and progresses slowly.

### Etiopathogenesis

- It is still not clear.
- Various theories proposed so far label it as developmental condition, degenerative condition, hereditary dystrophy and endocrine anomaly.

### Symptoms

Patients present with a defective vision, due to progressive myopia and irregular astigmatism which does not improve fully despite full correction with glasses.

### Signs

- Window reflex is distorted.
- Placido disc examination shows irregular the circle.
- Keratometry depicts extreme mal alignment of mires.
- Photokeratoscopy reveals distortion of circle.
- Slit lamp examination may show thinning and ectasia of central cornea, opacity at the apex and Fleisher's ring at the base of cone, folds in desmets and bowman's membranes, very fine, vertical deep stromal striae (vogt's lines) which disappear with external pressure on the globe are peculiar feature.
- On retinoscopy a yawning reflex (scissor reflex) and high oblique or irregular astigmatism is obtained.

- On distant direct ophthalmoscopy on annular dark shadow (due to total internal reflection of light) is seen which separates the central and peripheral areas of cornea (oil droplet reflex).
- Munson's sign i.e. localized bulging of lower lid when patient looks down is positive in late stages.

### Morphological classification

Depending upon the size and shape of the cornea the keratoconus is of three types;

1. Nipple cone has a small size (<5mm) and steep curvature.
2. Oval cone is larger (5-6mm) and globe like.
3. Globus cone is very large (>6mm) and globe like.

### Treatment

- Spectacles correction may improve vision in very early cases. However, later in the course of disease the falling vision may not be corrected by glasses due to irregular astigmatism.
- Contact lenses usually improve the vision in early cases.
- Intact, the intra corneal ring segments are reported to be useful in early cases.
- Corneal collagen cross linking with riboflavin (C3R) may slow the progression of disease.
- Keratoplasty may be required in later stages Deep Anterior Lamellar Keratoplasty (DALK) or Penetrating Keratoplasty (PK) may be improved.<sup>[3]</sup>

### Ayurvedic Review

Thought is not mentioned clearly;

- According to *Acharya Sushruta, Krishna Mandala* is originated from *Vayu Mahabuta*.<sup>[4]</sup>
- When *Vayu in Garbhavasta* gets vitiated due to *Dauhrida Vamana* leads to *Vikrutakshi*.<sup>[5]</sup>
- *Acharya Vagbhata* has taken outer part of cornea as *Twak* while describing *Sadhyasadyata* of *Kshata Shukra*.<sup>[6]</sup>
- So, keratoconus should be taken as *Twagata Vata (Rasa / Indriyagatavata)* described by *Acharya Charaka* which may be *Beejajanya*.<sup>[7]</sup>

- Vayu is said to be *Sarva Dhatu Vyuhakara* and *Kartagarbhakruti*. It means that Vayu is responsible for the regular function and amount of Dhatus in body; also, it is responsible for formation of normal body parts.
- In keratoconus *Krishna Mandala* of *Netra* which originate from Vayu itself is either malformed or gets degenerated due to defect in *Karma* of *Vata*.
- On the basis of previous research work keratoconus can be considered as *Timira*<sup>[8]</sup> and also supporting to this above statement, *Vataja Timira Lakshana* like 1. *Vyavidha Darshana* - The straight line of object appears to be curved, 2. *Avila Darshana* - Blurred vision or hazy vision, 3. *Chandra Deepadaya Anekatvam* - The luminous objects like moon, lamp is appearing to be multiple<sup>[9]</sup> are present, the same symptoms are observed in keratoconus disease. Considering these symptoms *Vataja Timira* can be correlated with keratoconus.

#### Ayurvedic treatment

So, *Twakgata Vata* should be treated as per explained by *Charaka* for *Rasagata Vata* i.e. *Shodhana* and *Shamana* with *Snehana*.

- *Agnideepana* which will increase the absorption of drug.
- *Shodhana - Mrudurechana*
- *Nasya*
- *Tarpana*

#### CASE REPORT

- Patient's name - xyz
- OPD no. - 40779
- Age - 17 yrs
- Occupation - Student
- Sex - Male
- Address - Bangalore
- Religion - Hindu
- Date of OPD visit - 2/12/2017

**Chief Complaints :** Blurring of vision in left eye since 2 years

**Associated Complaints :** Photophobia since 2 years

No floaters/flushes

#### History of present illness

He consulted Aastha eye hospital on 18/11/17 and diagnosed as a left eye keratoconus - FFKC (Forme Fruste Keratoconus) showing early progression and advised for left eye KXL or accelerated cross linking and spectacles.

#### Auto Refraction

Right eye				Left eye			
SPH	CYL	Axis	V/A	SPH	CYL	Axis	V/A
-2	-2.5	22	6/6	-1	-3	165	6/6
	-2.5	22			-3	165	

#### On examination

- Slight cone shaped thinning of cornea in left eye
- Corneal topography RE >40.6 D, LE >44.6 D
- LE - keratoconus - Early progression.

#### Visual acuity - Before treatment

Distant vision			Near vision	
	Without glass	With glass	Without glass	With glass
OD	6/18	6/18	N18	N8
OS	6/24p	6/18p	N10p	N8

#### Medical history

Advice for -

- Left eye - KXL (Collagen Cross Linking) or accelerate cross linking
- Spectacles
- Patient was not willing for surgery

**Treatment given:** (7/12/2017 to 1/1/2018)

- *Vaishwanara Choorna* - 3/4<sup>th</sup> tsp thrice a day, before food
- *Nasya* with *Ksheerabala-101 Taila* for 7 days
- *Triphala Kashaya Seka* for 7 days
- *Annalepa* for 7 days
- *Kataka Phala* drops- 2° - 0 - 2°
- *Tarpana* with *Mahatriphalagrita* for 5 days
- *Shigrupallava + Navaneetapindi*.

#### Effect of therapy

- Blurriness and photophobia were completely relieved.
- Visual acuity improved in left eye 5/60 to 6/12p for distant vision.

#### DISCUSSION

- Keratoconus usually manifest as a small island of irregular astigmatism in the inferior paracentral cornea.
- As the cornea bulges outwards, the amount of astigmatism increases due to progressive distortion of corneal surface.
- Based on the signs and symptoms keratoconus considered as *Vataja Timira*.
- Considering the *Dosha* involvement the treatment should be *Vatahara*. In this disease the *Stanika* treatment like *Nasya*, *Tarpana* and *Pindi* is helpful.

#### Action of Nasya

*Nasya* is beneficial when the symptoms of *Doshas* are just manifested and not involved the whole eye in *Vataja Timira*.<sup>[10]</sup>

#### Action of Tarpana

*Tarpana*<sup>[11]</sup> exert direct pressure upon the cornea there may be changes in refractive index of cornea and *Ghritha* has the quality of trans passing into the minute channels of body, it enters deeper layers of *Dhatu*s and cleans very minute part. The lipophilic

action of *Ghritha* 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 *Ghritha*. *Ghritha* has high levels of anti-oxidants which can reduce the damage of thinned cornea by allowing more tissue contact time and bioavailability of the drug from the corneal surface.<sup>[12]</sup> *Tarpana* is indicated in *Timira*, the commonly used *Ghritha* *Yogas* like *Jeevantiyadi Ghritha*, *Triphala Ghritha*, *Mahatriphala Ghritha* and *Shatavari Ghritha*. *Mahatriphala Ghritha* has high level of antioxidants of thinned out cornea. It helps in bulging down corneal protrusion by *Dosha Shamana* and mechanical pressure. In contemporary science C3R and intact is advised to strengthen the stroma tensile and flatten the central cornea but there is no assurance of cure as their methods are not without complications.

#### Action of Pindi

In *Pindi*,<sup>[13]</sup> medicine is absorbed through the skin of lids. By practice *Pindi* can advise to overnight that helps to flatten the corneal curvature by its mechanical pressure and strengthens the cornea by medicine effect. *Pindi* is indicated in *Shotha* and *Kandu*. *Shigru* is proven to have *Abhishyanadahara* nature. *Navaneeta* is a *Chakshushya Dravya* in *Sneha* form. So, this *Chakshushya Sneha* combination is helpful in bringing down the corneal protrusion by *Dosha Shamana* and mechanical pressure. In contemporary science, contact lens are advised to correct the myopia and astigmatism, aspheric lens with high eccentric value helps to flatten the cornea quicker. Compare to other lenses the main effect of contact lens is to provide a best vision to keratoconus patient, same effect gets my *Pindi* procedure.

#### CONCLUSION

Keratoconus is a progressive eye disease in which the normally round cornea thins and bulges out to form a cone shaped structure. Keratoconus is considered as *Twakgata Vata*. Ayurvedic treatment is done on the line of *Twakgata Vata* gives interesting results and above all no complications. Modern counterpart has

done tremendous effort but there is no assurance of cure as their methods are not without complications.

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