

## OCULAR MANIFESTATIONS AND THEIR MANAGEMENT IN DIABETICS WITH SPECIAL REFERENCE TO *MADHUMEHA*

Surangi K. G.<sup>\*1</sup>, Indu Sharma<sup>2</sup> and Shamsa Fiaz<sup>3</sup>

<sup>1&2</sup>PG Scholar, PG Department of Shalaky Tantra, National Institute of Ayurveda, NIA, Jaipur.

<sup>3</sup>Associate Prof. & HOD, PG Department of Shalaky Tantra, National Institute of Ayurveda, NIA, Jaipur.

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### \*Corresponding Author

**Dr. Surangi K. G.**

PG Scholar, PG Department  
of Shalaky Tantra, National  
Institute of Ayurveda, NIA,  
Jaipur.

### ABSTRACT

*Madhumeha* is a *Vātaja* type of *Prameha* which is considered as a *Mahagada* which is difficult to cure. *Prameha* may occur due to frequent utilization of *Kapha Vriddhikara* food and behaviors which lead to *Āma* formation and causes impaired *Agni*; both at gastric level (*Jatharagni*) and tissue level (*Dhatwagni*). Even though *Ayurveda* does not deal with the concept of insulin but has incorporated the pathogenesis based on the concept of *Agni* which includes all enzymes and hormones responsible for all the metabolic activities of the body. Hence this conceptual study was carried out with the aims of identifying similarities between *Madhumeha/Prameha* and ocular disorders. So that the manifestations related to *Madhumeha* or

*Prameha* are elaborated and effective treatment may be planned based on the pathophysiology. Diabetic retinopathy, diabetic cataract and glaucoma are the known ocular complications seen in diabetics and which are the leading causes for visual impairments and blindness. As per the available literatures in classics; there are few factors which have direct link between manifestation of eye diseases due to *Prameha* or *Madhumeha* based on etiological factors and *Apathya* food and behaviors. Thus people who are suffering from *Madhumeha* or diabetes have higher tendency to be affected with ocular anomalies than the normal population. Early diagnose and preventive measures along with intake of *Chakshushya* food and behaviors have a positive approach in diabetic patients in preventive ocular complications.

**KEY WORDS:** Eye diseases, *Vataja-Pittaja* & *Kaphaja Prameha*, Diabetes mellitus.

## INTRODUCTION

*Prameha Roga* which are twenty in number and occur due to vitiation of all three *Doshas* but have dominance of *Kapha Dosh*. However these are classified into 3 major types as per the predominant *Dosha* as *Kaphaja* (10), *Pittaja* (6) and *Vātajā* (4).<sup>[1]</sup> *Madhumeha* is a *Vātajā* type of *Prameha* which is considered as *Mahagada* (major disease) which is as an incurable disorder.<sup>[2]</sup> Further more *Acharya* Susruta quoted that all the types of *Prameha*, if neglected will ultimately convert into *Madhumeha*. *Prameha* may occur due to frequent utilizing of *Kapha Vriddhikara* diets or behaviors.<sup>[3]</sup> This may lead to *Āma* formation in the body, which causes impaired *Agni*; both at gastric level (*Jatharagni*) and tissue level (*Dhatwagni*). In this stage of *Mandāgni* the *Sneha Bhavas* and *Madura Bhavas* are not fully converted to end products and are expelled from the body. The involvement of *Agni* and *Āma* formation in *Prameha* is well documented in ancient authentic texts. *Prameha* is considered among the complications of *Ajirna* by *Acharya* Charaka. Sushruta said that *Vāta*, *Pitta* and *Kapha* in *Apakva* state alone can produce *Prameha*.<sup>[4]</sup> Sushruta added that its various combinations with *Dosha*, *Dhatu*, *Mala* and digestive products results in different types of *Pramehas*.

*Madhumeha* can be correlated with diabetes mellitus (DM) based on its signs and symptoms. Based on its pathogenesis also it is similar to DM because there is impairment of carbohydrate (*Kapha*), Protein (*Mamsa*) and fat (*Medas*) metabolism. In *Ayurveda* there is no description about insulin but have described it on the base of impairment of *Agni* which includes all enzymes and hormones responsible for all the metabolic activities of the body. Diabetes is a health episode due to its high prevalence. As per the WHO worldwide prevalence<sup>[5]</sup> of diabetes for all age groups is 2.8% in 2000 and it will be increased to 4.4% in 2030. The total number of diabetes patients is projected to increase from 171 million in 2000 to 366 million in 2030. In India it was 31.7 million in year 2000 with a projection to reach 79.4 million by year 2030. Hence current conceptual study was carried out with following aims and objectives.

### Aims and objectives

1. To identify similarities between *Madhumeha*, *Prameha* and ocular disorders.
2. To explore ocular manifestations related to *Madhumeha* or *Prameha* and their management.

**Aetiology or Nidanadi Karana for eye diseases**

Susruta and Vagbhata described the etiological factors in general for all the eye diseases where as Vāgbhata especially mentioned causative factors for *Timira*. The common causative factors of eye diseases can be categorized into several groups such as dietary factors, behavioral factors, psychological factors, traumatic or exogenous factors, improper conduction of procedures and environmental factors as follows.

**Table No. 1 – The common aetiological factors for eye diseases**

Etiological factors ( <i>Nidana</i> )	SS <sup>[6]</sup>	MN <sup>[7]</sup>	BP <sup>[8]</sup>	YR <sup>[9]</sup>	VS <sup>[10]</sup>	AH <sup>[11]</sup>
<b>Dietary Factors</b>						
1. <i>Amla</i> (acidic/sour taste food)	+					
2. <i>Ati Ambu/ Dravapana</i> (excessive use of water/ liquids)		+		+	+	
3. <i>Ati madhyapana</i> (excessive use of alcohol)		+		+	+	
4. <i>Asatmya</i> (unwholesome food)						
5. <i>Shukta</i> (excessive intake of vinegar)	+		+			
6. <i>Aaranala</i> (excessive intake of sour gruel)	+		+			
7. <i>Kulatha</i> (horse gram)	+		+			
8. <i>Masha</i> (black gram)	+		+			
9. <i>Vidagdha</i> (incompatible) food						+
10. Intake of water just after meals						+
<b>Behavioral Factors</b>						
1. <i>Ushnabhithaptasya Jala praveshath</i> (contact with water immediate after exposure to heated)	+	+	+	+	+	
2. <i>Doorekshanath</i> (gazing st distant objects)	+	+	+	+	+	
3. <i>Sookshma nireekshana</i> (seeing minute objects)	+	+	+	+	+	+
4. <i>Swapnaviparyaya</i> (inadequate/excessive sleep/daytime sleep)	+	+	+	+	+	
5. <i>Prasaktha samrodana</i> (constant weeping)	+	+	+	+	+	
6. <i>Atimaithuna</i> (excessive sexual indulgence)	+	+	+	+	+	
7. <i>Dhuma sevana</i> (exposure to smok)	+	+	+	+	+	
8. <i>Rajo sevana</i> (exposure to dust)		+	+	+	+	
9. <i>Vega dharana/nigraha</i> (suppression of natural urges)	+	+	+	+	+	
10. <i>Chardi Vegadharana</i> (omission of vomiting)	+	+	+	+	+	

11. <i>Bashpagraha</i> (suppression of tears)	+	+	+	+	+	
12. <i>Ati sheeghra yana</i> (travelling in fast vehicles)			+			
13. <i>Uthkatakāsana</i> (stand on heels)						+
14. <i>Kshuttrushnadi vidharanat</i> (suppression of hunger & thirst)						+
15. Look at sun, fire, lightening ect.						+
16. Looking at fast moving objects						+
<b>Exogenous /Traumatic Factors</b>						
1. <i>Shiroabhighata/Abhighata</i> (head trauma/trauma)	+	+	+	+	+	+
2. <i>Ruksha</i> (roughness)						+
<b>Psychological Factors</b>						
1. <i>Shoka</i> (grief)	+	+	+	+	+	+
2. <i>Kopa</i> (anger)	+	+			+	
3. <i>Klesha</i> (distress)	+	+	+	+	+	
4. <i>Chinta</i> (mental suffering)						+
<b>Improperly Conducted Procedures</b>						
1. <i>Vamana atiyoga</i> (excessive of <i>Vamana Karma</i> )	+	+	+	+	+	+
2. <i>Sweda</i> (sudation)	+	+	+	+	+	
3. Improperly conducted <i>Virechana</i> (purgation)						+
4. Improper conduction of <i>Nasya Karma</i>						+
5. Improper conduction of <i>Putapaka</i> therapy						+
<b>Environmental Factors</b>						
1. <i>Ritu viparyaya</i> (do not follow seasonal regiments)		+	+	+		
2. <i>Tapa</i> (exposure to heat)			+	+		

SS- Susruta Samhita

AH- Ashtanga Hridaya.

BP- Bhava Prakasha.

YR- Yoga Ratnakara.

MN- Madhava Nidana

VS- Vangasena Samhita

In addition to above factors Dalhana has highlighted following points;

- ***Avak Shiro Shayanam*** - Sleeping by keeping the head in the downward position than body.
- ***Uchhrīṭ Shayitasya*** - Sleeping by keeping the head in the upward position than body.
- ***Jwaruptapaat Ritu Viprayaya*** - Due to high fever or sun stroke, head including eyes are affected which causes eye diseases

**Common aetiological factors for eye diseases, *Prameha & Madhumeha***

In *Prameha* the main pathological factor is vitiation of *Kapha Dosha*. *Acharya* Susruta stated that clearly while describing common aetiological factors for *Prameha*.<sup>[3]</sup> All the factors mentioned there were *Kapha* aggravating food and behaviors such as day time sleeping, sedentary life style, regular use of cold-oily-sweet and watery food and beverages etc. Apart from these common factors *Acharyas* have mentioned specific causes for specific types of *Doshaja Prameha* as follows;

**1. Causative factors for *Kaphaja Prameha*** <sup>[12,13]</sup>

Frequent intake of black gram, fresh alcohol, *Apakva* curd, excessive intake of liquids-sour & salty food and behaviors like sedentary life, excessive sleep, avoidance of exercise and sleeping in with abnormal positions are the common causative factors mentioned in ocular diseases as well.

**2. Causative factors for *Pittaja Prameha*** <sup>[14]</sup>

Intake of hot, sour, salty, alkaline and pungent food, exposure to excessive hot-sun-heat-fire, frequent anger are causative factors for the *Pittaja Prameha* as well as for the eye diseases.

**3. Causative factors for *Vātaja Prameha*** <sup>[15]</sup>

Excessive intake of astringent-bitter-pungent taste food, excessive indulgence in sex, excessive emesis, suppression of natural urges, exposure to sun, anxiety, grief, keeping awake at night, irregular sleeping position are the aetiological factors for *Vātaja Prameha* and common causative factors of the eye diseases also.

***Upadrava (Complications) of Prameha and Madhumeha***

*Upadrava* manifests as another disease with more severe signs and symptoms of an original disease which arise at the end stage of the original disease. In this stage management of the disease is very difficult.

**Table No.2- *Upadrava of Prameha*** <sup>[16,17]</sup>

<i>Kapajaka Prameha</i>	<i>Pittaja Prameha</i>	<i>Vātaja Prameh</i>
Impairment of digestion	Pricking pain in bladder,	Tremors
Anorexia	penis	Catching pain in heart
Vomiting	Exudation from scrotum	Different kinds of desires
Excessive sleeping	Fever	Abdominal pain
Cough	Burning sensation	Inadequate sleep
Common cold	Thirst	Dryness in mouth, throat
Excessive mucus secretion	Increased acidity	Cough
Lassitude	Fainting	Dyspnoea
Dyspnoea	Loose bowel	Stiffness in body
	Burning sensation in testicles	Constipation
	Tearing pain in bladder	

	Pain in cardiac region Anorexia Vomiting Loss of sleep Anaemia Yellowish faeces, urine, eyes	
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While considering above mentioned complications; some causative factors for the eye diseases can be identified. Such as;

- Impairment of digestion, Anorexia – may lead to nutritional deficiencies which causes visual defects and several eye diseases
- Vomiting –excessive vomiting may cause *Vāta Dosha* vitiation and causes *Vātaja* type of eye diseases. Specially *Vamana* is contraindicated in *Timira* patients.
- Excessive sleep – may aggravate *Kapha Dosha* and causes *Kaphaja* eye diseases
- Loss of sleep – may vitiate *Vāta Dosha* and causes *Vātaja* type of eye diseases.
- Increased acidity, burning sensation & fever – may cause *Pittaja* type of eye diseases.

Apart from these complications *Acharyas* quoted that some *Pidaka* (boils/ulcers/cysts/eruptions) can be aroused in *Prameha* patients.<sup>[18,19]</sup>

Not only the aetiological factors some of the complications can also be correlate with the eye diseases as follows;

- Excessive mucus secretion – *Netra Srava, Abhishyanda, Puyaalasa, Pothaki, Shyava Vartma, Krimigranthi, Klinna Vartma, Savrana Shukla, Pittaja and Kaphaja Adhimantha, Akshipakathya, Amla Vidagdha Drishti*
- Burning sensation – *Shyava Vartma, Amyadhushta, Akshipaka, Ushna Vidagdha Drishti*
- Yellowness/Pale eyes – *Pittaja & Kaphaja Abhishyanda, Pitta Vidagdha Drishti*
- *Pidaka* – *Uthsangini, Puyaalasa, Upanaha, Parvani, Alaji, Kumbhika, Pothaki, Lagana, Anjana Namika, Vartma Arbuda, Sira Pidaka, Balasa gratita*

## Eye related complications of diabetes mellitus

### 1. Diabetic retinopathy

Diabetic retinopathy is a chronic progressive, potentially sight-threatening disease of the retinal microvasculature associated with prolonged hyperglycemia.<sup>[20]</sup> Almost all the patients with Type I diabetes develop retinopathy in about 15 years. Diabetics have a 20-25 times greater risk of blindness as compared to the normal population.<sup>[21]</sup> Diabetic retinopathy is

basically a *Dristipatalagata Roga* and is mainly attributed to *Sira Srotas Abhisyandam* and *Raktavaha Sroto Dusti* due to a variety of *Achakshyushya* food and behaviors especially in *Prameha* patients.<sup>[22]</sup> Mainly *Achakshyushya* factors vitiate *Pitta* and *Rakta*. This explains the logical approach towards the development of microvascular complications in diabetic retinopathy which manifests as symptoms of *Urdhwagata Raktapitta*. The whole pathology of Diabetic retinopathy starts with microangiopathy, which is clearly stated in Ayurveda as *Sroto Dusti* of *Raktavaha Srotos*, manifested as *Attipravriti*, *Sanga* and *Granthi* as haemorrhages, exudates and venous beading in diabetic retinopathy respectively. Diabetic Retinopathy can be compared to *Timira* involving all the four *Drishti Patalas*. The symptoms of vision are manifested when the vitiated *Dosha* and affect the concerned *Dhatu* in *Dristi Patalas*. All the three *Dosha* in single or in combination can affect one or more *Patalas* of *Dristi* (Retina). On the basis of different symptoms of *Timira* and stages of Diabetic retinopathy, a probable correlation and classification of Diabetic retinopathy is done as follows;

**Table No. 3- Probable correlation between diabetic retinopathy with *Patalagata* and *Doshaja Timira*** <sup>[23]</sup>

<i>Patalas</i>	<i>Doshaja Timira</i>	Visual Symptoms	Modern correlation/ classification of DR
Ist ( <i>Tejo Jalashrita</i> )	<i>Vataja</i>	Blurring of vision, Erythroptosis, micropsia Metamorphosis.	Mild NPDR
	<i>Pittaja</i>	Colour vision defects	
IInd ( <i>Mamsashrita</i> )	<i>Raktaja</i>	Blackouts/ Scotomas Smoky vision Color vision defects	Moderate NPDR
	<i>Sannipataja</i>	Polyopia, Diplopia Visual field defects Photopsia	Severe NPDR Preproliferative PDR
IIIrd ( <i>Medasashrita</i> )	<i>Parimlayee Timira (Pitta+Rakta)</i>	Photopsia Phosphenes	PDR Vitreous hemorrhages Retinal detachment
	<i>Parimlayee Kacha</i>	<i>Ragaprapta Dosha Dhatu Kshaya</i> Snow flake cataract	Diabetic Cataract
IVth ( <i>Asthiyashrita</i> )	<i>Sannipatika Linganasha</i>	Loss of vision	High Risk PDR Florid PDR

## 2. Glaucoma

Glaucoma is group of disorders characterized by progressive optic neuropathy which results in optic disk anomalies specific pattern of irreversible visual field defects and it variably associated with the raised Intra Ocular Pressure (IOP).<sup>[24]</sup> Diabetic patients have (40%) high risk<sup>[25]</sup> to develop Primary Open Angle Glaucoma (POAG) which is characterized by specific visual field defects, optic disc cupping, slowly progressive raised IOP and headache. These visual defects may be scotoma, difficulty in near work, delayed dark adaptation, significant loss of vision and blindness.<sup>[26]</sup> These signs and symptoms can be correlated with *Kaphaja Adhimantha* and specially visual defects in here shows close similarity with the 2<sup>nd</sup> *Patalagata Timira* (loss of vision, difficulty in near work etc.) as well.

## 3. Diabetic Cataract

Any opacity in the lens or its capsule is known as cataract which can develop due to various aetiological factors. Diabetics are 2-5 times more prone to get early cataract than the normal individuals; this risk may reach 15-25 times in diabetics less than 40 years of age.<sup>[27]</sup> Mainly diabetes is associated with two types of cataracts;<sup>[28]</sup>

- a. Senile cataract in diabetics – onsets at early age and progresses rapidly.
- b. True diabetic cataract – also called as “snowflake cataract”. Occur in young adults due to osmotic over hydration of the lens and appears as white snowflake like opacities in the lens cortex. Such opacities may resolve spontaneously or mature within few days.

Cataract dealt with gradual and painless disturbances of vision in varying degrees with colouration of lens as per the degree of opacity. Thus *Kācha* can be correlated with cataract and 3<sup>rd</sup> *Patalagata Timira* can be taken as the disease *Kācha* (immature cataract) according to the *Acharya Vagbhata* and *Dalhana* as 3<sup>rd</sup> *Patalagata Timira* is characterized by gradual loss of vision and *Rāgaprāpta* of *Drishti* (coloured visual area). Also 4<sup>th</sup> *Patalagatha Timira* can be correlated with the mature stage of Cataract as per its signs and symptoms.

### Management of ocular manifestations in *Prameha* patients

Treatment is all about correcting and preventing the etiopathological mechanism (*Samprapti Vighatana*). Hence the first and foremost care should be given to prevent *Madhumeha*. As per the *Chikithsa Sutra* management of *Madhumeha* is two types; *Santarpana* should be performed for the *Krishna* and *Durbala* (emaciated & weak) persons and *Samshodhana* for the *Stula* and *Bala* (obese & strong) persons. Specific therapies for the specific types of *Prameha* are as follows;<sup>[29]</sup>



*Kaphaja Prameha – Langhana & Vamana for Samshodhana*

*Pittaja Prameha – Virechana, Santarpana & Samshamana*

*Vātaja Prameha* including *Madhumeda* – Incurable but various decoctions and *Mantha* prescribed for the other varieties of *Prameha* can be used

Also some common diets are advised for all types of *Prameha* which are beneficial for the eyes (*Chakshushya*).

- *Mantha* and decoctions of barley
- Old *Shali* rice with *Mudga*
- Bitter taste vegetables
- *Jangala Mamsa* and flesh of some birds
- *Shastika* rice
- *Thriphala*

**Table No 4 – Recommended therapies for the ocular manifestations** <sup>[30]</sup>

<i>Diseases</i>	<i>Site of disease</i>	<i>Management</i>
<i>Netra Srava</i> (dacryocystitis)	<i>Netra Sandhi</i>	Incurable, <i>Siravyadha</i> , <i>Thriphala kalka</i> , <i>Pathyadi Varti anjana</i>
<i>Abhishyanda</i> (conjunctivitis)	<i>Sarvagata</i>	<i>Shamana chikithsa</i> as per <i>doshas</i> , All types of <i>Kriyakalpa</i> ( <i>Seka</i> , <i>Aschyotana</i> , <i>Pindi</i> , <i>Vidalaka</i> )
<i>Puyālasa</i> (dacryocystitis)	<i>Netra Sandhi</i>	<i>Raktamokshana</i> , <i>Upanaha</i> , <i>Shodhana karma</i> , <i>Anjana</i>
<i>Pothaki</i> (trachoma)	<i>Vartmagata</i>	<i>Lekhana</i> , <i>Prachchana</i> , <i>Pratisarana</i> , <i>Prakshalana</i> , <i>Asyotana</i> , <i>Anjana</i>
<i>Uthsangini</i> (chalazion)	<i>Vartmagata</i>	<i>Bhedana</i> , <i>Nispidana</i> , <i>Lekhana</i> , <i>Pratisarana</i> , <i>Pariseka</i> , <i>Rasakriya anjana</i>
<i>Shyava Vartma</i> (inflammation due to penetrating injury)	<i>Vartmagata</i>	<i>Lekhana</i> , <i>Pratisarana</i>
<i>Krimigranthi</i> (blepharitis)	<i>Netra Sandhi</i>	<i>Swedana</i> , <i>Bhedhana</i> , <i>Pratisarana</i> , <i>Rasakriya Anjana</i>
<i>Klinna Vartma</i> (blepharitis)	<i>Vartmagata</i>	<i>Bhesaja saadya</i> , <i>Ashastrakrita</i>
<i>Savrana Shukla</i> (corneal ulcer)	<i>Krishnagata</i>	<i>Gharshana</i> , <i>Anjana</i> , <i>Tarpana</i> , <i>Vaivarna nashana</i> , <i>Raktamokshana</i> , <i>Basti</i> , <i>Grita paana</i>
<i>Pittaja Adhimantha</i> (orbital cellulitis/secondary glaucoma/iridocyclitis)	<i>Sarvagata</i>	<i>Langana</i> , <i>Sneha pana</i> , <i>Raktamokshana</i> , <i>Virechana</i> , <i>Seka</i> , <i>Aschyotana</i> , <i>Anjana</i> , <i>Nasya</i> , <i>Tarpana</i> , <i>Putapaka</i> , <i>Pindi</i> , <i>Bidalaka</i>
<i>Kaphaja Adhimantha</i> (chronic glaucoma/POAG)	<i>Sarvagata</i>	<i>Vyadhana</i> , <i>Swedana</i> , <i>Seka</i> , <i>Langana</i> , <i>Avapidana</i> , <i>Nasya</i> , <i>Anjana</i> , <i>Dhumapana</i> , <i>Aschyotana</i> , <i>Pindi</i>
<i>Akshipakathya</i> (keratitis/pan)	<i>Krishnagata</i>	Incurable, <i>Netrapurana yoga</i>

ophthalmitis/hypopyon ulcer)		
<i>Amla Vidagdha Drishti</i>	<i>Drishtigata</i>	<i>Snehapana, Virechana, Pradeha, Anjana</i>
<i>Amlyadhushita</i> (allergic conjunctivitis)	<i>Sarvagata</i>	<i>Langana, Snehapana, Raktamokshana, Virechana, Aschyotana, Anjana, Lepa, Tarpana</i>
<i>Ushna Vidagdha Drishti</i> (night blindness)	<i>Drishtigata</i>	<i>Snehapana, Virechana, Pradeha, Anjana</i>
<i>Pitta Vidagdha Drishti</i> (day blindness)	<i>Drishtigata</i>	<i>Nasya, Parisheka, Anjana, Alepa, Putapaka, Tarpana</i>
<i>Upanaha</i> (advanced stage of dacryocystitis)	<i>Netra Sandhi</i>	<i>Bhedhana, Lekhana, Prakshalana Pratisarana, Prachchana, Swedana, Agni karma</i>
<i>Parvani</i> (phlyctenular conjunctivitis)	<i>Netra Sandhi</i>	<i>Swedana, Chedana, Lekhana, Pratisaran</i>
<i>Alaji</i> (phlyctenular conjunctivitis/dacryocystitis)	<i>Netra Sandhi</i>	<i>Incurable, Chedana</i>
<i>Balasa gratita</i> (cyst/nodule in conjunctiva)	<i>Suklagata</i>	<i>Kapha shamaka, Kshara karma, Anjana</i>
<i>Kumbhika</i> (Multiple styes/cysts in zeis gland)	<i>Vartmagata</i>	<i>Swedana, Lekhana, Lepa, Pratisarana, Parisheka</i>
<i>Lagana</i> (chalazion)	<i>Vartmagata</i>	<i>Bhedana, Pratisarana, Kshara krma, Agni karma, Nasya, Anjana</i>
<i>Anjana Namika</i> (stye)	<i>Vartmagata</i>	<i>Swedana, Nispidana, Bhedana, Pratisarana, Anjana</i>
<i>Vartma Arbuda</i> (lid tumour)	<i>Vartmagata</i>	<i>Chedana, Pratisarana, Kshara karma</i>
<i>Sira Pidaka</i> (Limbal nodule)	<i>Shuklagata</i>	<i>Lekhana, Chedana</i>
<i>Timira</i> (visual defects)	<i>Drishtigata</i>	<i>Gritapana, Nasya, Anjana, Siravyadhana, Thriphala</i>
<i>Kācha</i> (Cataract)	<i>Drishtigata</i>	<i>Anjana, Tarpana, Na,sya, Putapaka</i>

## DISCUSSION

Eye is the most precious sensory organ when compared to others as knowledge is dependent on eye sight. Hence *Acharya Vagbhata* advised to protect the eyes with every effort.<sup>[31]</sup> Diabetes can be taken as a major health disaster in current scenario and it is worst due to its complications like diabetic retinopathy- neuropathy- nephropathy and foot ulcers etc.

By considering all matters explored in this article there is a direct relationship between eye diseases and *Prameha* or *Madhumeha* due their common causative factors. *Prameha* occurs due to vitiation of *Kapha Dosha* due to frequent association of *Kapha* aggravating food and behaviors. Hence there is a higher tendency for acquiring *Kaphaja netra vikaras* in *Prameha* patients. Apart from these common causative factors *Acharyas* have described several unwholesome food and behaviors (*Apathya ahara & vihara*) which are responsible for vitiation of *Tridoshas*. Therefore due to these specific unwholesome factors respected types

of *Doshaja* eye diseases can occur in that particular *Doshaja* type of *Prameha* patient. Such as *Vātaja Prameha/Madhumeha* patients may have higher tendency to get *Vātaja* eye diseases like *Timira* or visual defects. This was substantiated as diabetic retinopathy, diabetic cataract and glaucoma as common eye complications in diabetic population which manifests as visual defects.

Apart from etiological factors some of the complications of *Prameha* may lead to ocular manifestations; because these provoking factors for eye diseases. For example impairments in digestion and anorexia may cause nutritional deficiencies and lead to visual impairments, excessive sleeping may cause *Kaphaja* eye diseases etc. Also some of the complications itself act as ocular manifestations like *Pidaka*, hyper secretion, pale eyes etc. These *Pidaka* can be in the form of a boil, cyst, ulcer or eruptions anywhere in the eye such as *Anjana Namika* or *Uthsangini* in lids. Hence it can be said that diabetics are more prone to get ocular complications when compared to general population.

The other important fact observed in this study is the similarity of treatment modalities in eye diseases and *Prameha*. Especially it was revealed that the wholesome food and behaviors (*Pathya*) are same in both the conditions such as regular use of *Triphala*, *Shali & Shashtika* rice, bitter taste vegetables etc. Apart from those; special ocular therapeutics like *Akshi Tarpana*, *Putapaka*, *Seka*, *Aschyotana*, *Vidalaka*, *Pindi* etc. which are called as *Netra Kriyakalpa* are beneficial in eye diseases.

## CONCLUSION

Hence it can be stated that the people who are suffering from *Madhumeha* or diabetes have higher tendency to get ocular anomalies than the normal population due to common aetiological factors and are also prone to develop complications resulted on account of the above disease. Despite this people who are willing to follow the regiments against *Madhumeha* or diabetes may have a greater chance of preventing the complications. Hence regular eye checkups to detect early onset of symptoms along with regular *Kriyakalpas*, *Pathyapathya*, intake of *Chakshushya Dravyas* etc. help in preventing the complications as well as curing the complications much better.

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