

## AYURVEDIC MANAGEMENT OF DIABETIC RETINOPATHY: PRESENT SCENARIO

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### ABSTRACT

Diabetes is a chronic, metabolic disease characterized by high levels of glucose in blood, which leads to serious damage to the heart, blood vessels, eyes, kidneys, and nerves. Diabetic retinopathy (DR) is the most common complication of diabetes mellitus. It is a microangiopathy affecting retinal precapillary arterioles, capillaries and venules. It is a Progressive dysfunction of the retinal blood vessels caused by chronic hyperglycemia. Initially, it is asymptomatic, if not treated though it can cause low vision and blindness. *Ayurveda* is well recognized for its role in preventing the disease, but as such no description is available in text which clarifies the progression of *Madhumeha* to loss of vision. It can be compared to *pramehajanya timira*. So Ayurvedic treatment purely lies on the basis to pacify the pathological changes which occurs in eye as a result of diabetes according to modern parameters. As no satisfactory treatment is available for diabetic retinopathy, new approaches are needed to slow the progression and limit the damage caused by this disease. Ayurvedic drugs and therapy controls the disease and increases blood circulation and nourishes retina and stop the further vision loss. This paper reviews the pathophysiology of diabetic retinopathy in modern and ayurveda along with treatment modalities and preventive aspects.

**Keywords:** Diabetes mellitus, Diabetic retinopathy, *Madhumeha*, *pramehajanyatimira*,

### INTRODUCTION

Diabetes is a chronic, metabolic disease characterized by high levels of glucose in blood, which leads to serious damage to the heart, blood vessels, eyes, kidneys, and nerves. Approximately worldwide 382 million people have been esti-

mated to have Diabetes Mellitus in 2013 and if no action is taken this number will rise to 592 million by 2035<sup>1</sup>. Diabetic retinopathy (DR) is the most common complication of diabetes mellitus. DR is the most frequent cause of new

cases of blindness among adults aged 20–74 years. During the first two decades of disease, nearly all patients with type 1 diabetes and >60% of patients with type 2 diabetes have retinopathy<sup>2</sup>. In the Wisconsin Epidemiologic Study of Diabetic Retinopathy (WESDR), 3.6% of younger-onset patients (type 1 diabetes) and 1.6% of older-onset patients (type 2 diabetes) were legally blind. In the younger-onset group, 86% of blindness was attributable to diabetic retinopathy. In the older-onset group, in which other eye diseases were common, one-third of the cases of legal blindness were due to diabetic retinopathy<sup>3</sup>. Risk factors for diabetic retinopathy include – uncontrolled glucose levels, long duration of Diabetes, Obesity, Pregnancy, Hyperlipidemia, Cataract Surgery, Anaemia etc. Despite of better understanding of its pathogenesis, satisfactory treatment is yet not available. *Ayurveda* is well recognized for its role in preventing the disease, but as such no description is available in text which clarifies the progression of *Madhumeha* to loss of vision. So Ayurvedic treatment purely lies on the basis to pacify the pathological changes which occurs in eye as a result of diabetes according to modern parameters.

There is some common etiological factor for *Timira* (Vision loss) and *Prameha* (Diabetes) are available in classics. Causative factors like sour taste, *sukta*, *aranala*, *masha*, irregular sleep suppression of urges are achakshushya factors in *Prameha* which leads to development of *Timira*. *Timira* explained based on different dosha predominance can be compared to Diabetic retinopathy and can be termed as *Madhumehajanya timira*.

#### AIM AND OBJECTIVES:

1. To explain the management modalities for Diabetic retinopathy in Ayurveda.
2. To explain the preventive aspects for Diabetic retinopathy.

#### MATERIALS AND METHODS:

Diabetic retinopathy is a micro angiopathy affecting retinal precapillary arterioles, capillaries and venules. It is a Progressive dysfunction of the retinal blood vessels caused by chronic hyperglycemia. Initially, it is asymptomatic, if not treated though it can cause low vision and blindness. It is the leading cause of blindness and develops frequently in the long standing cases of diabetes mellitus, controlled or uncontrolled.<sup>4</sup>

#### RISK FACTORS:

**Duration of diabetes:** It is most important determining factor. Roughly 50% of patients develop diabetic retinopathy after 10 years, 70% after 20 years and 90% after 30 years of onset of disease. The course and severity of diabetic retinopathy leads to nephropathy, systemic hypertension, positive family history, smoking, obesity and hyperlipidaemia<sup>4</sup>

**Sex:** Incidence is more in females than males (4:3).

**Poor metabolic control:** It is less important than duration, but is nevertheless relevant to the development and progression of diabetic retinopathy.

#### PATHOPHYSIOLOGY:

Pericytes present in the retinal blood vessels are lost in DR leads to weakening of small vessels wall. It appears as a small red spot in retina. Some of the thin walled **micro aneurysms** and fragile retinal capillaries may rupture and cause retinal haemorrhages, results in deep haemor-

rhages (**dot and blot haemorrhages**) and superficial haemorrhages (**flame shaped**). Break-down of blood retinal barrier causes leakage of plasma constituents in the retina and form **hard exudates** and retinal oedema. Hard exudates are deposits of plasma proteins and lipids. Due to prolonged diabetes mellitus there occurs thickening of capillary basement membrane etc. leads to micro vascular occlusion which in turn lead to retinal hypoxia, results in retinal ischemia, and manifest as “**cotton wool spots**” or **soft exudates**. The two main effects of retinal hypoxia are 1) Arteriovenous shunts 2) Neovascularisation (There is proliferation of new vessels from the capillaries in the form of neovascularisation at the optic disc (NVD) or elsewhere (NVE)).<sup>5</sup>

Diabetic Retinopathy has been variously classified. Presently followed classification is as follows:

- Non Proliferative Diabetic Retinopathy (NPDR) - Mild NPDR, Moderate NPDR, Severe NPDR, Very severe NPDR.
- Proliferative Diabetic Retinopathy (PDR).
- Diabetic Maculopathy.
- Advanced Diabetic eye diseases.

Diabetic Retinopathy is a *Tridoshaja pramehjanya upadrava roga* (Symptom wise it is a complication of diabetes), mainly it is a *Kapha Pitta vriddhi* in *pitta sthaanam*. Pujiyapada muni in his book *netraprakashika* explains *Timira* as *upadrava* of *meha*. Diabetes mellitus is known as *madhumeha* in ayurveda. *Dushya* is *meda* (predominance), *mamsa*, *rakta*, *vasa*, *majja*, *lasika*, *kleda*, *shukra*, *ojas*<sup>6</sup>. So it is clear that all the body tissues are involved in *madhumeha*. All the tissues or organs may be damaged in this

disease. It not localized in any one organ of the body but may vitiate any of the important organs. From this it may be clear that eyes are also affected by *Madhumeha*. *Kha vaigunya* (all 4 *srotho dushti*) occur in *sookshma raktavaha* srothuses in this disease. “*Hrinetrajihvasravanopadesheshu*” mentioned in classics which gives direct clue regarding the involvement of vital organs like eye in development in *Prameha*.<sup>7</sup>

### DIAGNOSIS:

1. Fundus examination – Retina (inner layer of retina examination)
2. Glucose levels in blood – Fasting, post prondal and Random blood sugar
3. Optical Coherence Tomography

### DISCUSSION

Diabetic retinopathy can be well controlled by Ayurvedic treatment as Ayurvedic herbs not only reverse the blood clots formed in the retina and vitreous but also strengthen the metabolic function so that further chances of blood leakage can be minimized. Ayurveda controls the disease and increases blood circulation and nourishes retina. Use of Ayurvedic therapies disables the disease and possibility of being cured increases.

From ancient times, plants have been used for curing several ailments of human being. Even today with advancement of allopathic medicine, tribal and rural population are still dependent on the herbs of medicinal interest. Herbs prove good antidiabetic agents as they not only improve glucose and lipid metabolism by stimulating insulin release. Some herbs are proved good antidiabetic agents as they not only improve glucose and lipid metabolism by stimulating in-

sulin release. Herbs which are having antioxidant property can be used in this.

**Table 1:** List of few common using herbs in Diabetes mellitus<sup>8</sup>

Sanskrit Name	Latin name	Useful part	Action in DR
<i>Amalaki</i>	<i>Embelica officinalis</i>	Fruit	<i>Pramehagna, raktapittahara, stambana, cakshushya, mutrala</i>
<i>Hareetaki</i>	<i>Terminalia chebula retz.</i>	Fruit	<i>Sothagna, vranashodhana, rasayana, pramehagna</i>
<i>Vibetaki</i>	<i>Terminalia bellerica roxb.</i>	Fruit	<i>Netrahita, sothahara, raktastambana, vatagna</i>
<i>Lodra</i>	<i>Symplocos racemosa Roxb.</i>	Bark	<i>Cakshushya, rakta vikara hara, raktastambhaka, sothagna</i>
<i>Mesarungi</i>	<i>Gymnema sylvestre B. Br.</i>	Leaves	<i>Netra sulagna, pramehagna</i>
<i>Kiratatikta</i>	<i>Swertia chirata Buch.Ham</i>	Total herb	<i>Raktadoshahara, sothaghna, pachana</i>
<i>Guduchi</i>	<i>Tinospora cordifolia Willd.</i>	Stem	<i>Rakta shodhana, pramehaghna, rasayana, Tridoshagna</i>
<i>Haridra</i>	<i>Curcuma longa Linn.</i>	Rhizome	<i>Pandughna, pramehaghna, sotha hara, rakta doshahara</i>
<i>Vaasa</i>	<i>Adathoda vasica Nees.</i>	Leaves	<i>Sthambhana, raktapitta hara, pramehaghna, sothahara</i>

Probable protocol can be applied in Diabetic retinopathy are different treatment protocol can be followed in diabetic retinopathy; it includes eliminative process i.e *virechana* (Purgation), *Raktmokshana* (Bloodletting), *Jalaukavacharana* (Leech therapy), *takradhara* (Poring medicated buttermilk on forehead), *Ghrtapana* (Intake of Medicated ghee), *Akshitarpana* (Eye Nourishing technique), *Netraseka* (Irrigation), *Lepa* (Application of medicated past), *Ashothana* (Usage of medicated eye drops), *Anjana* (Collyrium), Oral medication like *Triphla ghrita*, *Mahatriphla ghrita*, *Patoladi ghrtam*, *Jivantyadighrita*, *Triphla churan*, *Shatavari churan*, *Vasaguducyadi kashayam*, *Patola katuohinyadi kashaya* etc<sup>9,10,11</sup>

**Takradhara** improves the action of tharpaka kapha which is vitiated in DR by srothorodha

that can be compared with micro vascular occlusion. It improves the circulation of rakta where the areas are getter *pandutwa*, represents cotton wool spots. It has *lekhana* property which beneficial for DR in exudates removal. It reduces dot and blot hemorrhages there by improves the vision and also reduces the *kleda* and *kapha* in retina.

**Jalaukavacharana** improves the blood circulation, reduces aneurysms and helps in exudates removal. Hirudin with 65 amino acids having acidic property causes decrease in whole blood viscosity and density that might formed due to obstruction. Its saliva has anti-inflammatory and analgesic action.

Most of the drugs above mentioned are *pramehaghna*, *sothahara*, *mutrala*, *rakta pittahara*, *sthambhaka* and *cakshushya* which

are helpful to reduce the effects of *pramehajanya timira*.

#### Advised Diet and deeds:

- Food should be light diet/ low calorie diet
- Old rice and unpolished rice, Wheat etc
- *Amalaki* (Indian goose berry), *Punarnava*
- Frequent Screening of diabetes
- Screening retinopathy once in a year

#### Avoidable diet and deeds:

- Irregular diet and sleep
- Intake of more curd, Fish etc
- Sleeping in day time
- Frequent intake of meat
- Frequent taking of fresh and polished rice, pulses
- Excess use of tobacco (Smoking etc)
- Excessive strain to eyes

## CONCLUSION

Diabetic Retinopathy is a complication of diabetes mellitus. It is the leading cause of blindness in elderly subjects. As no satisfactory treatment is available for diabetic retinopathy, new approaches are needed to slow the progression and limit the damage caused by this disease. Ayurvedic drugs and therapy controls the disease and increases blood circulation and nourishes retina and stop the further vision loss.

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