



A REVIEW ON DIABETIC RETINOPATHY AND ITS MANAGEMENT IN AYURVEDA

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ABSTRACT

Eye is unique structure of the body and its anatomical and physiological framework is said to be unique. Eye is the mirror of the systemic conditions of the body. If any pathology occurs in the body its reflection seen in the eyes. Diabetic retinopathy is one of the ocular manifestations of the systemic disease and sight threatening disease. Diabetic retinopathy is covered under *Prameheja Timira* in *Ayurvedic* concept. The treatment of modern system of medicine is focal laser therapy, anti-vascular growth factor drugs. These treatment modalities have some side effects. The aim of this conceptual study is to manage the diabetic retinopathy or *Prameha janya Netra rogas* by means of *Ayurvedic* adaptation and reduce the further complications of diabetic retinopathy.

KEYWORDS: *Prameheja Timira, Prameha janya Netra rogas.*

INTRODUCTION

Secondary life style and enormous amount of stress have created a strong platform for good number of life style disorder including diabetic mellitus, which affects almost every system in the body. It is associated with long term complications involving eyes, kidney, nerves and blood vessels.

In eye, Diabetic retinopathy is one of the major complications of Diabetes mellitus. Diabetic retinopathy is a chronic progressive, potentially sight threatening disease of the retinal microvasculature associated with prolonged hyperglycemia and other conditions linked to DM, are HTN, hyperlipidemia and protein urea etc. The severity of diabetic retinopathy increases as duration of disease increases. Ayurveda plays a significant role in management of diabetic retinopathy.

Etiopathogenesis^[1]

1. Duration of diabetes is the most important determining factor.
 - Like after 10 years 20% of type I and 25% of type II diabetics develops retinopathy.
 - After 20 years 90% of type I and 60% type II diabetics develops retinopathy.
 - After 30 years 95% of both types I and II diabetics develop diabetic retinopathy.

i. e. age of onset of diabetes also act as a risk factor.

2. Poor metabolic control is less important than the

duration but is nevertheless relevant to the development and progression of diabetic retinopathy.

3. Heredity, Hypertension, Sex are some other contributing factors.

Pathogenesis^[2]

Diabetic Retinopathy has features of both micro vascular occlusions and leakage.

1. Microvascular leakage

The capillaries of retina are lined by pericytes along with endothelial cells and basement membrane. These pericytes are responsible for structural integrity of vessel wall. These pericytes are specifically lost early in diabetic retinopathy. Physical weakening of capillary walls due to loss of pericyte result in localized saccular outpouching of vessel wall, termed microaneurysm. It appear as a small red spot. Some of the thin walled microaneurysms and fragile retinal capillaries may rupture and cause retinal haemorrhages, results in deep haemorrhages (dot and blot haemorrhages) and superficial haemorrhages (flame shaped). In addition there is breakdown of blood retinal barrier due to many factors, especially as a result of opening of tight junction between adjacent microvascular endothelial cell processes. Breakdown 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. All the lesions often occur more near macula and optic disc.⁶

2. Microvascular occlusion

Due to prolonged diabetes mellitus there occurs thickening of capillary basement membrane, capillary endothelial cell damage and proliferation, changes in R.B.C's (i.e. elasticity of R.B.C reduced) and increased stickiness and aggregation of platelets. All together leads to microvascular occlusion which in turn lead to retinal hypoxia, results in retinal ischaemia, which initially develops in the mid retinal periphery. Appearance of ischaemic areas due to occlusion of capillaries may manifest as "cotton wool spots" or soft exudates. These are microinfarct of nerve fibre layer of retina. Venous dilation, beading and looping of the veins occurs secondary to ischaemia.

The two main effects of retinal hypoxia are 1) Arteriovenous shunts 2) Neovascularisation. All these occur in an attempt to revascularise the hypoxic areas of retina. Formation of arteriovenous shunts from arterioles to venules associated with significant capillary occlusion are referred as intraretinal microvascular abnormalities (IRMA). Retinal hypoxia leads to release of vasoproliferative substance such as vascular endothelial growth factor (VEGF). It results in development of neovascularisation i.e. proliferation of new vessels from the capillaries in the form of neovascularisation at the optic disc (NVD) or elsewhere (NVE) in the fundus along the course of major temporal retinal vessel and occasionally on the iris (rubeosis iridis) and angle of anterior chamber (neovascular glaucoma). This neovascular tissue is more fragile, bleed easily and incites a fibroblastic response. These new vessels may proliferate in the plane of retina or spread into the vitreous as vascular fronds. Later on condensation of connective tissue around the new vessels result in formation of fibro vascular epiretinal membrane. Vitreous detachment and vitreous haemorrhage may occur in this stage. Later fibrovascular and gliotic tissue contracts to cause retinal detachment and blindness.

Diabetic retinopathy Classification^[4]

The classification used in the Early Treatment Diabetic Retinopathy Study is widely used internationally.

1. Non proliferative Diabetic Retinopathy (NPDR) is characterized by microaneurysms, dot and blot haemorrhages and exudates. Generally the earlier signs of DR, although persisting as more advanced lesions appear.
2. Diabetic Maculopathy strictly refers to the presence of any retinopathy at the macula, but commonly reserved for significant changes, particularly vision-threatening oedema and ischaemia.
3. Preproliferative diabetic retinopathy (PPDR) manifests cotton wool spots, venous changes, intraretinal microvascular anomalies (IRMA) and often deep retinal haemorrhages. PPDR indicates progressive retinal ischaemia, with a heightened risk of progression to retinal neovascularization.
4. Proliferative diabetic retinopathy (PDR) is characterized by neovascularization on or within one

disc diameter of the disc (NVD) and/or new vessels elsewhere (NVE) in the fundus.

5. Advanced Diabetic Eye Diseases is characterized by tractional retinal detachment, significant persistent vitreous haemorrhage and neovascular glaucoma.

Treatment

Medical, photocoagulation and surgical treatment is advised in diabetic retinopathy is according to presented stage of disease. Medical treatment of diabetic retinopathy is aimed at prevention of retinopathy. Tight glycaemic control is associated with reduction in the development of retinopathy. Good metabolic control and proper management of hypertension or other associated conditions prevent the progression of diabetic retinopathy. No treatment is required for background diabetic retinopathy with normal visual acuity except periodic annual examination.

Once the sight threatening Diabetic retinopathy has been detected, treatment option are limited Management of Diabetic retinopathy includes diet restrictions, control of systemic risk factors, pharmacological modulation, intravitreal steroids, coagulation and vitrectomy. Laser photocoagulation therapy has been proven effective in reducing diabetic retinopathy progression and vitrectomy can in many cases prevent severe vision loss in patients with advanced stages of Diabetic retinopathy. Both laser photocoagulation and vitrectomy improve quality of life from patients with diabetic retinopathy and are cost effective.

Pramehjany Netra Roga

There is no direct reference is told by *Acharyas*, detailing about the diabetic retinopathy, though with the help of creditable references it can be correlate with *Pramehjanya Sannipataj Timira*.

Charaka enumerated the general *Samprapti* of *Prameha*,^[5] in *Cikitsasthana*. He narrated that due to over indulgence of etiological factors, *Kapha* along with *Meda*, *Mamsa* and *Kleda* get vitiated and results into formation of metabolic waste which is carried towards *Basti* resulting *Prameha*. In same manner *Pitta* get vitiated resulting *Pittajaprmeha*. While *Vata* due to depletion of other two *Dosha* get provoked, further cause's depletion of *Dhatus* by excreting them through urine resulting *Vataja Prameh*.

Sushrutacharya in *Netra sharira*, give explanation about 6-*Patala*. Externally eye is covered under external 2 *Patala* (*Urdhva* and *Adho Vartma*) & 4 internal *Patala*. The functioning of *Netra* depends upon *Vatavaha*, *Raktavaha*, *Kaphvaha* and *Pittavaha Sira*. Vitiated *Dosha* and *Dushya* are circulated in upward direction through *Sira*,^[5] riches to the *Patalas* produces *Netra Vikar Timira*. In *Timira* severity of disease or progression of disease depends upon successive involvement of respective *Patalas*.

Ayurvedic Management

No treatment is mentioned for background diabetic retinopathy with normal visual acuity except periodic annual examination. Photocoagulation and surgery are only available treatment for macular diabetic retinopathy and proliferative diabetic retinopathy which is costly and not much effective at severing loss of visual acuity. Thus a patient desires for a reliable treatment to save his or her vision at any cost and is moving towards alternate and effective medical therapy.

Diabetic retinopathy can be well controlled by *Ayurvedic* treatment as *Ayurvedic* herbs not only reverse the blood clots formed in the retina but also strengthen the metabolic function so that further chances of blood leakage can be minimized. In *Madhumeha Dosha* is *Kapha Pradhan Tridosha*. *Dushya* are *Meda* (predominance), *Mansa*, *Vasa*, *Majja*, *Lasika*, *Kleda*, *Shukra*, *Oja*, So it is clear that all body tissues including eyes are affected in *Madhumeha*. According to *Charakas* and *Vagbhata*s, eye is afraid from *Kapha Dosha*. *Netra* is *Tejo Mahabhoot Pradhana*. If we analyses the *Prameha* and *Netra roga Samprapti* with co-relation of pathogenesis of diabetic retinopathy, we can see the involvement of all types of *Sroto Dushti*e, *Atipravruithi*, *Sanga*, *Siragranthi*, *Vimarga gamanam*. So *Samanya Chikitsa Sidhanta* in *Ayurveda* for diabetic retinopathy can be considered as follows- 1) *Pramehahar Chikitsa*, 2) *Kaphahar –Srotodhhar Chikitsa*, 3) *Urdhavraktapittahar Chikitsa*.

Kaphaurutta Pitta is predominant factor for *Utpatti* of *Pramehjanya Netra Rogas*. So for removing *Sang* in *Sirras* which is caused by *Doshas Kaya Shodhana* is required. *Snehpan* is advised with *Triphala Gritha*, *Mahatriphala Gritha*, *Jivantyadi Gritha* followed by *Virechan* should be insisted for *Kaya Shodhana*. For *Virechana Kalyanak Guda*, *Sudha Kalpa*, *Argvadha* should be used according to *Doshaavastha*, *Sharirbala*. *Acharya Vagbhata* mentioned *Chakshushya*, *Pramehahara*, *Rakta-pittaghna basti* mainly containing *Earand kwath*, *Yashtimadhu Klaka*. *Nasya*, *Kriya alpa* procedures can be advised for *Sthanika Netra Chikitsa* mainly having *Rakta-Pittahara* Properties.

Shaman Chikitsa- The drug having properties like *Pramehahara*, *Rakta-Pittahara* and *Chakshushya* should be preferred. In Oral medication *Triphala Ghrita*, *Mahatriphala Ghrita*, *Patoladi Ghrita*, *Churna* like- *Triphala*, *Yashtimadhu*, *Bilwa*, *Khadira*, *Vasa*, *Lodhra*, *Sariva*. *Saptamrit Loha kalpa*, *Loha Bhasma*, *Shilajit Bhasma*.

These medication does not 100% cured your disease but can keep stable in that condition.

CONCLUSION

Diabetic retinopathy is leading cause of blindness involving the microangiopathy of retinal precapillarie arterioles, capillaries and venules. As very few

satisfactory treatments are available in modern for diabetic retinopathy *Ayurveda* can helps for treating diabetic retinopathy. On analysis of the whole scattered description related to *Netra sharir*, *Netraroga Samprapti* and *Prameha samprati*, it is helpful to understand the *Ayurvedic* view of diabetic retinopathy and *Ayurvedic* management of Diabetic retinopathy. Holistic approach of *Ayurvedic* treatment helps to control sugar level as well as improve or maintain visual acuity by arresting the further progression of disease.

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