



AYURVEDIC APPROACH TO DIABETIC RETINOPATHY

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ABSTRACT

Diabetic Retinopathy (DR) is a chronic progressive, potentially sight threatening disease of retinal microvasculature associated with prolonged hyperglycemia. The risk of development of blindness in diabetics increases by 20-25 times as compared to the normal population have great concerns which leads to find out preventive measures in Ayurveda. Currently available conventional options for diabetic retinopathy have certain limitations. Ayurveda, the traditional system of Indian subcontinent hold huge number of remedies that can be useful in the treatment of diabetes and preventing associated complications like diabetic retinopathy. Prevention is all about correcting and preventing the etiopathological mechanism (Samprapti vighatana). So as per etiopathological mechanisms described, the first and foremost care should be given to prevent madhumeha. The prevention of diabetic retinopathy revolves around treating the causes of madhumeha, management of Urdwaga Raktapitta, prevention of dhatu kshaya including oja kshaya and prevention of Agnimandya in general. Ayurvedic therapies like Pancha Karma (Purification/cleansing procedures), Shamana (Pacifying medicinal treatment) and Netra Kriya Kalpa, Rasayana in DR were found to be significantly effective.

KEYWORDS: Diabetic retinopathy, Ayurveda, Urdwaga Raktapitta, Agnimandya.

• INTRODUCTION

Every living organism has unique features in its anatomical and physiological framework so that it can sustain to a large extent from the challenges of external hazards. Being the most developed link in the revolutionary chain human have best possible defense mechanism and adaptation power against many number of external challenges. The body tissues and muscles are developed in such a way that it can resist to a wide range of physical and mental conflicts. But the modern era, its development, new life style all made a drastic change in the normal well-being of human life and he is becoming more prone to the external hazards day by day. This in turn led to a tranquil life style with less usage of naturally available sources and activities. The sedentary life style and activities with stress and strain made the human prone to many life style disorders including diabetic mellitus.

• Aims and Objectives

Aim of the present study is to undertake a conceptual study on the managing aspects diabetic retinopathy.

Objective is to treat by Shodhana, Shamana and Sthanika Netra Chikitsa and to reduce the further complications of diabetic retinopathy.

Diabetes mellitus

Diabetes is a widely prevalent disease in the current era. It is a heterogeneous condition with number of symptoms and complications. It can be defined as a metabolic disorder caused due to the combination of environmental or hereditary factors resulting in abnormally high blood sugar level. Diabetes mellitus is a group of disorders due to either alterations in glucose secretions or insulin absorption. Long term high blood sugar levels will have negative effects on entire body functions and may lead to diabetic neuropathy, diabetic nephropathy and diabetic retinopathy. Many complications can occur if it is not treated or controlled accordingly, (Hypoglycemia, ketoacidosis etc.) long term complications include chronic renal failure, cardiovascular damages, nerve damages, micro vascular damages which may also cause poor wound healing. Poor healing of wound particularly of the lower extremities can lead to gangrene and possibly to amputation. Out of these complications above discussed,

Diabetic retinopathy is most difficult to manage and disabling as it affects the vision of the patient. Ayurvedic descriptions about Prameha shows very much resemblance with that of diabetic mellitus both in aetiopathogenesis and management aspects. Ayurvedic science has grouped Prameha under Mahagadas as it is

clearly told that Kricchasadhya or Yasya. The basic causative factor for Prameha includes both Beejadusti and Mithya Ahara-Vihara. For diabetic mellitus, the terminology Madhumeha is more suitable. Madhumeha has got two different types of pathogenesis; the concept of Avarana and Dhatu kshaya can be adopted. Prameha usually predominant with Kapha Dosha, by the passage of time other Doshas will also get predominant. Moreover a good number of Dushyas also involving in the Samprapti of Prameha, making it as Krichrasadhya.

The complications of Prameha is considered mainly due to the presence of Kleda in Rakta and in Raktavaha Srothas. The Kleda when combines with all the Tridoshas will initiate different Vikritis in all the Trimarmas, namely Shiras-Nabhi-Vasti which may be seriously affected if the condition of Prameha is not properly treated in time. Increased risk of ocular microvasculopathy, coronary artery disease and diabetic nephropathy supports that view.

In Shiras, it usually affects Netra Indriya leading to wide range of complications that even leads to blindness. Some of the major ocular complication of diabetic mellitus includes diabetic retinopathy, cataract, diabetic maculopathy, diabetic pappilopathy and various type of refractive errors. This paper is highlighting on the Ayurvedic approach of diabetic retinopathy.

• Incidence

Diabetic retinopathy (DR) is predominantly a microangiopathy in which small blood vessels are particularly vulnerable to damage from hyperglycemia. DR is an ocular manifestation of the systemic disease which affects more than 70% of the patients having DR for 10 years or more. It is more common in type 1 diabetes than in type 2 and sight-threatening disease is present in up to 10%. Proliferative diabetic retinopathy (PDR) affects 5–10% of the diabetic population; type 1 diabetics are at particular risk with an incidence of about 60% after 30 years.

Diabetic retinopathy

Diabetic Retinopathy has been variously classified.

Presently followed classification is as follows

I. Non Proliferative Diabetic Retinopathy (NPDR)

- Mild NPDR
- Moderate NPDR
- Severe NPDR
- Very severe NPDR

II. Proliferative Diabetic Retinopathy (PDR)

III. Diabetic Maculopathy

IV. Advanced Diabetic eye diseases

Diabetic Retinopathy is a microangiopathy which affects the retinal precapillary arterioles, capillaries and venules.

This microangiopathy causes

1. Microvascular leakage
2. Microvascular occlusion.

➤ *Microvascular leakage*

Normally capillaries are lined by single layer of endothelial cells and basement membrane. But in retinal capillaries, they are also lined by Pericytes. 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.

➤ *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. Arteriovenousshunts
2. Neovascularisation.

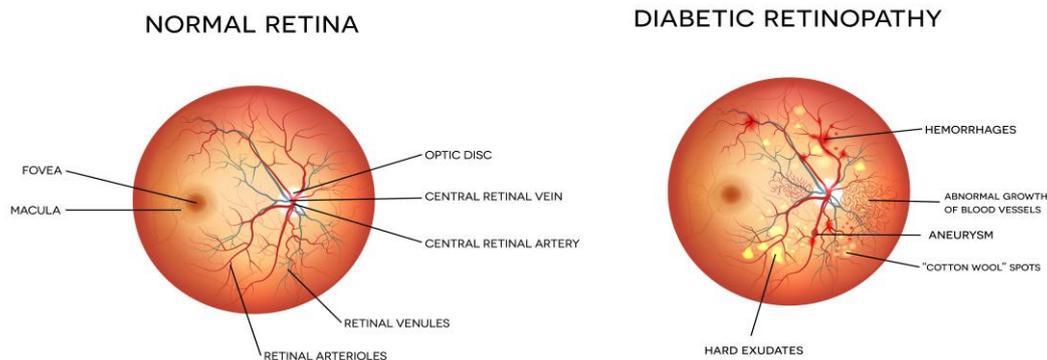
All these occur in an attempt to revascularise the hypoxic areas of retina. Formation of arteriovenous shunts from arterioles to venules associated with significant capillary occlusion are referred as intraretinal microvascular abnormalities (IRMA). Retinal hypoxia leads to release of vasoproliferative 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 results 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.

- **Diagnosis**
 - Fundus examination
 - Blood sugar level

DIABETIC RETINOPATHY



➤ **Classification (Ayurvedic view)**

1) **On the basis of involved Doshas**

- Kapha-pitta Pradhana
- Vata-pitta Pradhana

2) **On the basis of samprapti**

- **Kapha-Avaranavasta** - Simple background retinopathy
- **Raktapitta prakopavasta** - Diabetic maculopathy
- **Urdwaga raktapittavasta** - Pre-proliferative Diabetic retinopathy
- **Vataja linganasham** - Proliferative Diabetic retinopathy

Kapha-avaravasta- Kapha Dosha in Dravavast produces Srothodusti in the eye and leads to Dhatwagni Vaigunya. The Raktadhatwagni Vaigunya leads to Rakta Srothovaha Vaigunya and cause deposition of Samakapha in the minute channels. The result is Khavaigunya of the Srothas.

Rakta-pitta prakopavasta- Pitta and Rakta are Ashrayashrayibhavas. The already existing Rakta Dusti in the eye causes Pitta Prakopa. Mild presence of Pittakopa, Rakta Prakopa and Srothorodha in the Raktavaha Srothas and malfunctioning of Vyana and Prana Vayu lead to the destruction of the micro vessels (Lomika) and consequent dilation.

Urdwaga raktapittavasta - It is a state of hemorrhage formation. Here Rakta and Pitta which are already in a vitiated form, the sites where the vessels are already dilated, due to Atipravrutti of Doshas, Rakta Srava(hemorrhage) from some points of dilation.

Vataja linganasham -In this stage there will be a marked occlusion in the end arteries of the retina. It is due to Avarodha of the Pranavayu. This leads to hypoxia of the 4th Patala (retina) which is made up of Nadis. The result is the infarction in the retinal layer. This lead to various structural transformation in the retina leading to the formation of Vijatheeya Lomikas (neo vascularization). These Vijatheeya Lomikas structurally and functionally abnormal and undergo easily rupture leading to Rakta Srava (hemorrhage). Due to chronicity Srava may be extended to 3rdPatalaPradesha. ie; vitreous and thus formed vitreous hemorrhage.

• **Treatment**

The treatment mentioned in Prameha, Raktapitta, Kaphaja Timira, Abhishyanda can be ayurvedic adaptation as the treatment modality for the different condition of DR.

Samanya Netra Roga Prathishedha along with Kaya Shodana and Shamana Chikitsa can be adopted for the management of DR.

✓ **Shodhana therapy:** Kaya Shodana should be done for eliminating the Amadosha from the Shareera. Snehapana with Triphala Gritha, Maha Triphala Gritha followed by Virechana (Depending upon doshavstha).

✓ **Shamana therapy**

Shamana can be given for those who are not fit for undergoing Shodana therapy. Shamana Oushadi should be Pramehahara as well as Chakshushya in action. Ropana, Sthambana, Sheeta drugs can be preferred. Triphala formulation is a better drug of choice in all conditions and stages of DR. In Kapha-Avarana Avastha drugs like *Lajjalu, Khadira, Bilwa, Haridra, Ashwagandha* give a better result. In stage of Rakta-Pitta, *Vasa, Lodhra, Musali, Yashti, Manjista, Sariva, Chandana* drugs can give a better result. Pratimarsha Nasya can be with *Anu Taila and Shadbindu Taila*.

Saptamritha Loha, Asanadi Gana Kashaya, Sameera Panchaka Kashaya, Guduchyadi kashya.

✓ **Sthahnika netra chikitsa**

In Sthahnika Chikitsa, Kriya Kalpa procedures can be adopted like Seka, Ascotana, Tarpana and Shirotalam.

Seka can be given with *Vasa, Amalaki, Lodhra, Yashti Kashayas* etc drugs.

Aschotana with *Triphala Ghrita, Maha Triphala Gritha* etc.

Tarpana with *Triphala Ghrita, Maha Triphala Ghrita, Jeevanthyadi Gritham etc. Shirotalam with Vasa Churna, Yashti Churna, Amalaki Churna, Lodhra Churna* etc can be adopted according to the stage of Vyadhi.

➤ **Preventive measures according Samprapti (Etiopathogenesis) (Samprapti vighatana).**

So as per etiopathological mechanisms described, the first and foremost care should be given to prevent madhumeha. The prevention of diabetic retinopathy revolves around treating the causes of madhumeha, management of Urdwaga Raktapitta, prevention of dhatu kshaya including oja kshaya and prevention of Agnimandya in general.

✓ **Agnimandya prevention**

Agnimandya at tissue level is called Dhatwagnimandya. With proper dipana-pachana drugs, like Trikatu churna Jatharagni as well as Dhatwagni can be corrected as per individual requirement.

Sodhan chikitsa

Initially, detoxification of the body is important part of all the Ayurvedic therapies. So as to clear the channels and stop the perfusion. Along with this step diabetes should be in control.

Due to dhatwagnimandya, accumulation of impurities occurs at the srotas/capillary level. For this Virechan can be advocated.

Nasya with oil prepared from chakshyusya drugs should be done for urdhwajatrugata. srotas sodhan. Urdwajatrugata: Vata anad pitta shaman -Nasya, Shirodhara, Shirolepa and Shiropichu treatments. (Vata shaman treatment for head and body, and pitta Shaman treatment for eyes).

✓ **Dhatu kshaya prevention: Vata (vascular changes)-**

Paritarapan (Nourishing therapy) Santarpan chikitsa. Virechan and Basti with chakshyushya drugs. Shothahar treatment + Basti treatment (to prevent retinal/macular edema). Madutailika Chakshyusya Basti (beneficial in Rakapitta as well as chakshyusya in nature).

✓ **Raktapitta preventives**

Raktapittahari kriya aahar, virechan, Upavasa (Fasting) all the procedures should be advised in case of different stages of Madhumehajanya timir.

✓ **Kriyakalpa**

1. **Tarpan:** Patoladi ghrita, Jivantyadi ghrita Drakshyadi ghrita, Doorvadya ghrita. Mahatriphala Ghrita. In Dhatukshyajanya pathology Jivantyadi Grita Tarpana is useful. Raktavritta Vata janya cases Patoladi ghrita Tarpana is useful.

2. **Putapaka:** Ropana type of putapaka is indicated in Pitta, Rakta, Vrana conditions of eye. Breast milk, meat of animals of Jangala origin, honey, ghee and Tikta rasa herbal drugs are used for Ropana Putapaka.

3. **Aschyotana:** Triphaladi ghrita, Doorvadi ghrita and Patoladi ghrita can be used in the dose of 3-4 drop. Triphaladi, Prapoundarikadi anManjisthadi Aschyotana can be used in initial stages of NPDR cases.

4. **Pariseka:** Pariseka with drugs having Tikta Kashaya Rasa and Chakshyusya properties helps in healing intra retinal blood vessels.

5. **Anjana:** Ropana and Dristiprasadana type of Anjanas might be helpful in treating and preventing DR pathogenesis in pakwavastha like Sarivadyanjana andrakshyadi varti anjana.

6. **Rasayan:** All the palliative and preventive Rasayan drugs are useful for the prevention. Especially *Shilajatu Guggulu, Chyavanprash* and Brahma rasayan are mostly helpful. These Rasayan drugs are also useful in diabetic retinopathy cases, as oxidative stress theory is well established in pathology of Diabetic Retinopathy and Ama theory in madhumeha too has role in development of Diabetic Retinopathy.

7. **Systemic drugs for preventon:** Depending on the strength of the patient and stages of disease *Triphaladi churna, Triphaladi kwatha, Chandraprabhavati, Mahavasadi kwatha, Vasakadi kwatha* can be advised.

Ayurvedic adaptation for Life style along with these treatment, if person follows:

1. Dinacharya

2. Ritucharya- getting up in “Brahmi Muhurta” sets the biological clock properly and this is the equilibrium of the Doshas to work in the right way.

Appropriate habit of diet, exercise, meditation and life style which helps to maintain control the blood sugar level.

Practicing

Sirobhyanga (Head massage),

Anjana (Instilling medication in eyes)

Padabhyanga (Foot massage),

Pratimarsha nasya,

Pada trana dharana (Footwear) and

Chatra dharana (Umbrella)

Will help in maintaining the health of eye.

Adopt suitable measure according to Ritu and Dosha like avoiding day sleep except in summer season.

• **DISCUSSION AND CONCLUSION**

Diabetic retinopathy is a disease of Dristipatala (Retina) and complication of long standing uncontrolled diabetes due to defective metabolism and endocrine dysfunction. All the three doshas are affected with rakta (As both dosha and dushya), mainly vata, pitta, rakta and kapha anubandha. All the dhatus are affected with rakta, meda and mamsa predominant, sira srotas of raktavaha srotas and Ojavaha dhamani gets affected in successive stages. Agnimandya and Ama formation, raktapitta and dhatu kshaya are few aspects of pathogenesis. Breaking the link of pathogenesis along with the rasayan, chakshushya dravya santarpana can prevent the development of Diabetic retinopathy.

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