

## DIABETIC RETINOPATHY

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### ABSTRACT

Diabetes is a major health problem that approaching epidemic proportions globally. With staggering increase in diabetes world wide, the incidence of retinopathy, a common microvascular complications of Diabetes is expected to rise to disquieting levels. Diabetic retinopathy is blood vessel damage in retina that happens as a result of diabetes and is potentially a blinding complication of Diabetes mellitus. Ayurveda, well perceived for its role in preventing the disease, but as such there is no direct correlation for this condition. The reference of “Netra upadeha” as mentioned in Charaka samhita can be considered. As the associated costs due to diabetes related complications are a global health concern and as there is pyramiding of the numbers, concerted effort is needed to be taken up to tackle the condition & thus hamper the progression of Prameha to loss of vision.

### INTRODUCTION

Diabetic Retinopathy refers to retinal changes seen in patients with diabetic mellitus. With increase in life expectancy of diabetes, the incidence of diabetic

retinopathy (DR) has increased, and it has become one of the leading causes of blindness. It is ocular manifestation of systemic disease.



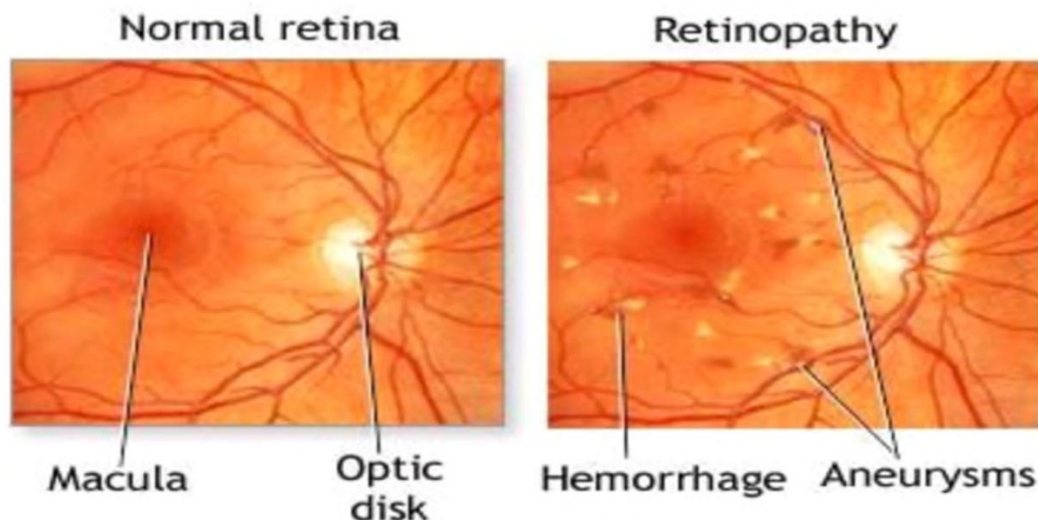
Vision by normal person.



Vision by diabetic retinopathy patient.

### RISK FACTORS

- Duration of Diabetes:
- Roughly 50% of patients develop DR after 10 years.
- 70% of patients develop DR after 20 years.
- 90% of patients develop DR after 30 years of onset of DM
- Sex: Females are more affected than males (4:3).
- Pregnancy: It accelerates the chances of DR.
- Hypertension: Along with diabetes, hypertension accelerates the changes of DR.
- Other factors: Smoking, obesity accelerates the DR.



### PATHOGENESIS

DR is a vascular disease of retina, especially affecting retinal pre capillary arterioles, capillaries and venules. The pathogenesis is as follows.

- Because of diabetes mellitus there will be thickening of capillary basement membrane and damage of capillary endothelial cell, which results in changes in RBCs: deformation and rouleaux formation. These results in micro vascular occlusion which further leads to retinal ischemia, retinal oedema or may leads to capillary leakage, micro Aneurism, haemorrhage, hard exudates, finally ending up with Neovascularisation.

### CLASSIFICATION

Depending on the stage of DR, it is classified as:

1. Non proliferative Diabetic Retinopathy (NPDR)
  - Mild NPDR
  - Moderate NPDR
  - Severe NPDR
  - Very Severe NPDR
2. Proliferative Diabetic Retinopathy (PDR)
3. Diabetic Maculopathy (DM)
4. Advanced Diabetic Eye Disease (ADED)

### 1. NON PROLIFERATIVE DIABETIC RETINOPATHY

This is the initial retinal capillary microangiopathy. The following changes are seen:

- i) Varying thickness of basement membrane.
- ii) Capillary microaneurysms
- iii) Waxy exudates accumulate in the vicinity of microaneurysms. Especially in the elderly diabetics because of hyperlipidaemia.
- iv) Dot and blot haemorrhages in the deeper layers of retina.
- v) Soft 'cotton-wool spots' appear on the retina which are microinfarcts of nerve fibre layers.

### NPDR CLASSIFIED INTO

- i) Mild NPDR - Any or all of micro aneurysms, retinal haemorrhage, exudates, cotton wool spots. No IRMA or significant bleeding.
- ii) Moderate NPDR - Severe retinal haemorrhages in 1-3 quadrants or mild intra retinal micro vascular abnormalities IRMA.
- iii) Severe NPDR - The 4-2-1 rule one or more of:
  - Severe haemorrhage in all 4 quadrants
  - Significant venous beading in 2 or more quadrants
  - Moderate IRMA in 1 or more quadrants
- iv) Very severe NPDR - Two or more of the criteria of severe NPDR.

### 2. PROLIFERATIVE DIABETIC RETINOPATHY

After many years, retinopathy becomes proliferative. Severe ischaemia and chronic hypoxia for long period leads to secretion of angiogenic factor by retinal cells and results in the following changes:

- i) Neovascularisation of the retina at the optic disc.
- ii) Friability of newly-formed blood vessels causes them to bleed easily and results in vitreous haemorrhages.
- iii) Proliferation of astrocytes and fibrous tissue around the new blood vessels.

### 3. DIABETIC MACULOPATHY

Changes in macular region need special mention, due to their effect on vision. These changes may be associated with non-proliferative diabetic retinopathy (NPDR) or proliferative diabetic retinopathy (PDR). The diabetic macular edema occurs due to increased permeability of the retinal capillaries.

Clinically significant macular edema (CSME) is diagnosed if one of the following three criteria are present on slit-lamp examination with 90D lens:

- i) Thickening of the retina at or within 500 micro of the centre of the fovea.
- ii) Hard exudates at or within 500 micron of the centre of fovea associated with adjacent retinal thickening.

- iii) Development of a zone of retinal thickening one disc diameter or larger in size, at least a part of which is within one disc diameter of the foveal centre.

#### 4. ADVANCED DIABETIC EYE DISEASE

It is the end result of uncontrolled proliferative diabetic retinopathy. It is marked by complications such as:

- Persistent vitreous haemorrhage
- Tractional retinal detachment
- Neovascular glaucoma.

#### SYMPTOMS

- The eye appears normal to look.
- Black spots or patch on the visual field.
- Sometimes vision becomes clear sometimes blurring.
- Floaters and flashes.
- Poor night vision.
- Distorted vision.

#### SIGNS

- Retinal haemorrhages.
- Micro aneurysms in macular area.
- Hard exudates, yellowish white, waxy looking, patches are arranged in clumps
- Macular Oedema.
- Cotton wool spots
- Neovascularization.

#### DIAGNOSTIC TESTING

- Fundus Fluorescein Angiography.
- Fundus photography.
- Optical Coherence Tomography(OCT)
- Ultrasonography(B-scan)

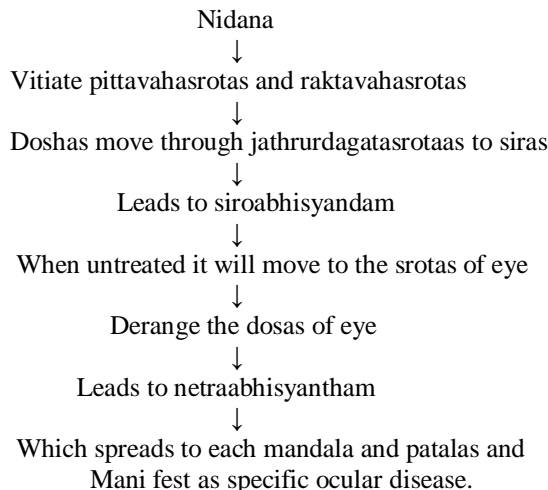
#### MANAGEMENT

- Strict metabolic control of blood sugar.
- Lipid reduction.
- Correction of anemia/ hypoproteinemia.
- Intra vitrial steroid injections.
- Laser surgery. (Pan retinal photo coagulation)
- Pars plane vitrectomy in advanced PDR.

#### AYURVEDIC VIEW

- No exact correlation of diabetic retinopathy.
- Nidanasof Prameha and Netraroga play hand in hand role.
- Prameharogi indulging in more Achakshushya nidanas, there will be ocular manifestations.
- In poorvaroop and upadravas of prameha, ocular manifestation is mentioned as  
हन्नेत्रजिह्वाश्रवणोपदेहो [Ch.Chi 6/13-14]

#### SAMPRAPTI OF PRAMEHAJANYANETRAROGA



#### PATHIYA AND APATHIYA

##### PATHYA

- Eat more vegetables
- Make mind calm
- Practise pranayama.

##### APATHYA

- Avoid pramehakara ahara vihara.
- Snigdha usna ahara
- Abhisyanthikara ahara
- Ativyayama and ativyavaya
- Bending head and keeping head in improper position.

#### LINE OF TREATMENT

- Antarparimarjana chikitsa and Bahirparimarjana chikitsa
- Prameha chikitsa
- Rasa rakta srothodushti chikitsa
- Brahmana chikitsa
- For Kaphanirharana :- Aschyotana and Seka [Kapha-pittahara drugs]
- In case of haemorrhage according to Pratimarga chikitsa Urdhagaraktapitta harachikitsa, Virecana can be used.
- Takradhara, Sirolepa and Siropichu with Sheetha sthambhana oushadhis.
- In case of Macular odema:- Sophahara chikitsa .
- In case of Sangha and Siragranthi:- Takradhara which act as Srotosodhana

# Thalapothichil and Thalam with Seetha drugs act as Sthambhana, which is helpful in bleeding conditions.

#### SOME AYURVEDIC MEDICATIONS

1. Amrithotharam Kashaya – 15ml ks + 45ml Luke warm water. (Morning and Night ; B/F)
2. Punarnavadi Kashaya- 15ml ks + 45ml Luke warm water. (Morning and Night ; B/F)
3. Chandraprabha vati- (1bd after food with Luke warm water)

4. Sudarsanam tab- (1bd after food with Luke warm water)
5. Vara choornam- 1tsp with 1 glass hot water at night, half an hour before sleep)
6. Thalam/ Sirolepa- choornas of Laksha, Vasa, Mustha, Yasthi, Amalaki with Vasaguluchyadi Kashaya
7. Purampada – with Mukadi gulika
8. Thakradhara- with Mustamalaki Kashaya + Thakra
9. Head rest

## CONCLUSION

The prevalence of DM is growing rapidly world wide and is reaching epidemic proportion and one which shows no sign of abating. With diabetes now recognized as a global epidemic, the incidence of retinopathy, a common microvascular complication of diabetes is expected to rise to alarming levels.

The duration of diabetes is probably the strongest predictor for development and progression of retinopathy and is potentially a blinding complication of diabetes mellitus. Thus DR is an end organ response to a systemic disease.

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