

Management of Diabetic Retinopathy through Shigru Pallava (Moringa oleifera Leaves)- Based Ocular and Oral Therapy: An Optical Coherence Tomography- Assessed Case Report

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Abstract:

Diabetic retinopathy (DR) is a microvascular complication of diabetes mellitus (DM) characterized by progressive damage to the retinal vasculature. Diabetic Macular Oedema (DME) develops due to pathological accumulation of extracellular fluid within the macular region, leading to retinal thickening and swelling. DME may arise at any stage during the natural course of diabetic retinopathy and is a major cause of visual distortion and vision loss among individuals with Diabetes mellitus. In recent decades, therapeutic modalities such as intravitreal anti-vascular endothelial growth factor (Anti-VEGF) agents, intravitreal corticosteroids, retinal photocoagulation and laser-based interventions have significantly transformed the clinical management of diabetic retinopathy. A 58-year-old male presented to the outpatient department in January 2025 with a complaint of progressive reduction in vision in both eyes in the past six months, greater impairment noted in the right eye compared to the left. He was a known case of diabetes mellitus for the past 15 years. On his visit to the OPD, his glycemic control was 8.5% (HbA1c). There was no family history of DM or DR. Based upon the history, clinical features and Optical Coherence Tomography (OCT) moderate NPDR in bilateral eyes and maculopathy in the right eye were diagnosed. *Shigru pallava* eye drops, *Shigru pallava churna* (Powder) and standard care of DM were prescribed up to 50days, at end of the treatment; there was improvement in visual acuity in both eyes. Blood Sugar level was reduced. The observations reveal that *Shigru Pallava*- based ocular and oral therapy are helpful in managing diabetic retinopathy.

Keywords: Diabetic retinopathy, Macular edema, *Shigru pallava Churna*, *Shigru pallava* eye drops, Moringa oleifera, Optical coherence Tomography, *Prameha-janya netra-patalagata-roga* (~Eye diseases related with diabetes mellitus)

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INTRODUCTION:

Diabetes mellitus is a significant metabolic disease that greatly affects the health and quality of life of individuals worldwide. Its prevalence has increased rapidly, making it a global public health concern and a major contributor to vision impairment. Poorly controlled blood glucose levels can damage the retinal blood vessels, leading to the development of diabetic retinopathy.¹ The severity of this condition is strongly associated with the duration of diabetes and the level of glycemic control. Diabetic retinopathy remains one of the leading causes of blindness globally.² Non proliferative DR (NPDR) and proliferative DR are the two clinical stages of DR. NPDR

represents the early stage of DR which shows retinal pathologies including microaneurysms, hemorrhages, and hard exudates, which can be detected by fundus Examination although the patients may be asymptomatic. DME is the most common cause of vision loss in patients with DR.³ Increased blood sugar levels will result in the accumulation of advanced glycosylated end products, which causes disruption of the Blood-Retinal Barrier (BRB) and altered vitreoretinal interface. The breakdown of the BRB leads to interstitial fluid accumulation in the retina causing DME.⁴ It can occur at any stage of DR and cause distortion of visual images and a decrease in visual acuity (VA). In contemporary medical science few treatment

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modalities are available like Intravitreal anti-vascular endothelial growth factor injections (anti-VEGF injections), Intravitreal steroids etc. For high risk or complicated proliferative retinopathy, Pan retinal laser photocoagulation and sometimes Pars-Plana Vitrectomy (PPV) surgery etc. are done.⁵ Hence it is the need to find out safe, effective and economic therapy in alternate systems of medicine which can slow down the progression of disease and the risk of visual loss.

PATIENT INFORMATION:

A 58-year-old male presented to the outpatient department in January 2025 with a complaint of progressive reduction in vision in both eyes over the past six months, with greater impairment noted in the right eye compared to the left. General examination revealed normal appetite, bowel habits, sleep and urinary function. Systemic evaluation showed no significant abnormalities in the cardiovascular, gastrointestinal, genitourinary, musculoskeletal and neurological systems. He was a known case of diabetes mellitus for the past 15 years, managed with oral metformin hydrochloride (500 mg once daily) On his visit to the OPD, his glycemic control was 8.5% (HbA1c). There was no family history of DM or DR.

CLINICAL FINDINGS

The patient was afebrile with Pulse-78/min and blood pressure- 130/80mm of Hg.

Ocular examination

Un-aided Distant Visual Acuity (DVA) was 6/60 in Oculus Dexter (OD)-right eye and 6/24 in Oculus Sinister (OS)-left eye, aided DVA best corrected visual acuity in Oculus Dexter (OD)-right eye was 6/18 and in Oculus Sinister (OS)-left eye was 6/9. Near visual acuity (NVA) in Oculus Dexter (OD)- right eye was N36 and in Oculus Sinister (OS)- left eye N18 without spectacles. After correction in Oculus Dexter (OD)-right eye was N18 and in Oculus Sinister (OS)-left eye was N6. The anterior segment examination was within the normal limit OU. The pupillary reaction was normal Intraocular pressure (IOP) by Schiottz Tonometry was 14.6 mmHg in both eyes. Posterior segment examination, direct and indirect ophthalmoscopy, Optic Coherence Tomography (OCT) revealed NPDR OU and maculopathy OD. The condition

was diagnosed as moderate NPDR in OS and clinically significant moderate NPDR with macular edema in OD.

Dashavidha pariksha (~ten-fold examination of the patient):

The *Prakriti* (~somatic constitution) of the patient was *Vata-Kapha*; *Vaya* (~age) was *Vardhakya* (~senility). *Satva* (~emotional), *Sara* (~healthy status of tissue elements), *Samhanana* (~firmness of tissues or organs), *Ahara shakti* (~Digestive capacity), *Vyayama shakti* (~Ability to performing exercise), *Pramana* (~measurement of body elements), and *Satmya* (body's adaptation) were *Madhyama* (~moderate).

Ashtavidha pariksha (~eight-fold examination of the patient):

Nadi (~pulse), *Mutra* (~urine), *Mala* (~bowel movements), and *Shabda* (~voice) were *Prakrita* (~normal), *Jihva* (~tongue) was *Nirama* (~normal), *Sparsha* (~examination by touch) was *Anushnasheeta* (~not too hot and cold). *Akriti* (~body stature) was *Madhyama* and *Drik* (~vision) was *Vikrita* (~impaired).

DIAGNOSTIC ASSESSMENT

Using the early treatment DR Study grading scale and the DR severity score⁶ A fundus examination using a direct ophthalmoscope and indirect ophthalmoscope, which confirms the diagnosis of moderate NPDR in OS and clinically significant NPDR with macular edema in OD. OCT was reported with macular edema in the right eye. Fasting blood sugar level dated 1/5/2025 was 290.16mg/dl, postprandial blood sugar level (PP2BS) was 302.62 mg/dl and HbA1C was 8.5% Urine examination showed the presence of Sugar. Other hematological findings were within normal limits.

TIMELINE AND THERAPEUTIC INTERVENTION

There was an improvement in distant and near visual acuity in both eyes noted on a follow-up which is further illustrated in figures 1, 2, and 3 for the right eye and left eye respectively.

Follow-up Time line:

Table 1: Follow up timeline before, during and after treatment

INTERVENTION	TIME LINE	SYMPTOMS	CHANGES OBSERVED IN BSL

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Shigru Pallava Eye Drops + Shigru Churna + DM Standard of Care (SOC)	1/5/2025	Gradual painless diminution of vision (RE>LE) & poor Glycemic control	Fasting BSL 290.16 mg/dl	Post Prandial BSL 302.62 mg/dl
	25/5/2025	Mild Vision Improvement with Reduction of BSL	246.30 mg/dl	280.52 mg/dl
	20/6/2025	Vision Improvement with Reduction of BSL	180.2 mg/dl	220.6 mg/dl

RE = Right eye, LE = Left eye, BSL = Blood sugar level, DM = Diabetes mellitus

Improvement in Visual Acuity:

Table 2: Visual acuity before, during and after treatment

VISUAL ACUITY	RIGHT EYE (OD)			LEFT EYE (OS)		
	Date	1/5/2025	25/5/2025	1/5/2025	25/5/2025	20/6/2025
DV	6/60	6/60	6/36	6/24	6/24	6/18
BCVA	6/18	6/18	6/9(P)	6/9	6/9	6/9
NV	N36	N36	N36	N18	N18	N18
NVC	N18	N18	N9(P)	N6	N6	N6

DV = Distance vision, BCVA = Best correction visual acuity, NV = Near vision, NVC = Near vision correction, P = Partial

Fundus Examination:

Table 3: Fundus Finding before and after treatment

DATE	FUNDUS EXAMINATION		
1/5/2025	Charact ers	Right Eye (OD)	Left Eye (OS)
		Media	Clear
	Optic Disc	Normal, Oval shape, Pinkish - yellow	Normal, Oval shape, Pinkish - yellow
	C:D ratio	0.3	0.3
	Macula	Foveal Reflex Dull	Foveal Reflex Dull
	GF	Microaneurysms (++) Blot hemorrhages in superotemporal, inferotemporal, and inferonasal quadrant, Superonasal Quadrant (++) hard exudates (++)	Microaneurysms (+) Blot hemorrhages in superotemporal, inferotemporal, and inferonasal quadrant (+) hard exudates (+)
20/6/2025	Media	Clear	Clear
	Optic Disc	Normal, Oval shape, Pinkish - yellow	Normal, Oval shape, Pinkish - yellow
	C:D ratio	0.3	0.3
	Macula	Foveal Reflex Dull	Foveal Reflex Dull
	GF	Microaneurysms (++) Blot hemorrhages in superotemporal, inferotemporal,	Microaneurysms (+) Blot haemorrhages in superotemporal, inferotemporal,

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		al, and inferonasal quadrant, Superonasal Quadrant (+) hard exudates (+)	al, and inferonasal quadrant (+) hard exudates (+)
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C:D ratio= Cup-Disc ratio, GF = General fundus

Therapeutic intervention:

Table 4: Intervention of Medicine

INTERVENTION	ROUTE	DOSE	FREQUENCY	DURATION
Shigru Pallava Eye Drops	Topical	2 Drop (0.10 mL)	4/day	50 days
Shigru Churna	Oral	5 gm	3/day	50 days
DM Standard of Care (SOC)	-	-	As required	50 days

DM = Diabetes mellitus, SOC = Standard of Care

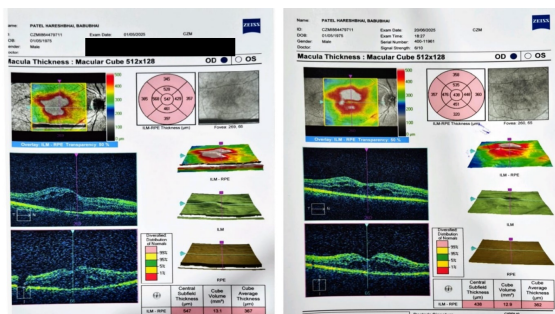


Figure 1: Optical coherence tomography (OCT) of Right eye before and after treatment

DISCUSSION:

Direct reference of *Prameha* (~DM) causing *Netravikara* (~eye disorders) cannot be seen in *Brihatrayees*, but many indirect references indicate that *Prameha* can manifest in eye diseases as *Upadrava* (~Complication). *Prameha* causing *Netravikara* quoted in *Netraprakasika*.⁷ In *Prameha* main etiological factor is vitiation of *kaphadosha* which is caused by *kapha* predominant *aahara* (~diet) and *vihara* (~lifestyle). According to the *ayurvedic Rachana sharira* (~anatomy)

of the eye, the functioning of the eye depends upon *Kaphavaha sira*, *Vatavaha sira*, *Raktavaha sira* and *pittavaha sira* (~ tubular vessels).⁸ *Dushita dosha* (~vitiated dosha) moves in *Urdhvajatrugata* (~ supraclavicular region) in upward direction through *sira* and reaches the *netrapatala* (~Layers) of eye, and produces the *Netravikara*. According to *Acharya Sushruta sandhibandhana* (~joint stability) of eye depending upon of *kapha*, vitiation of *kapha* leads to impeding normal functioning of eye that causes *sandhibandhana vikruti*.⁹ This *Sandhibandhana vikruti* leads to *sira*, means capillary endothelial cell damage and loss of capillary pericytes. *Prithvi* and *jala mahabhutas* are predominant in *kapha* dosha and *meda* is also play important role in *Akshi sandhibandhana*. Hence increase in *pruthavi* and *jala mahabhuta* causes the thinning of capillary wall. In *Prameha* mainly *meda* dhatu is affected, here *sira* is *mrudupaka* of *meda* and *upadhatu* of *meda*, so *sira* is also affected in *medavikruti*.¹⁰

From an ayurvedic standpoint the line of treatment adopted here is *nidana parivarjana* (~ avoidance of etiological factors) i.e. standard care of DM, *prameha chikitsa* (~Antidiabetic management), *Sophahara chikitsa*.

The patient reported the condition of poor blood sugar control. Therefore, *Shigru churna* were advised for internal use and for gradually painless vision loss *Shigru pallava* eye drops advised for topical use. *Shigru* having *pramehaghna* (~Anti diabetic) *Sophahara* (~Anti-inflammatory), *Rasayana* (~Antioxidant), *Chakshyushya* (~eye tonic), *Kapha—vatahara*¹¹ properties may help to enhance retinal circulation and improve the health of the retina. Preclinical studies have shown neuroprotective effect of *Moringa oleifera* in DR¹², therefore combining these ayurvedic modalities were selected.

Improvement of visual acuity may be due to reduction in macular oedema shown in OCT. *Moringa oleifera* leaves having Vitamin- A which is good for vision¹³, Vitamin- C which is Antioxidants¹⁴, Vitamin- E which is inhibit cell proliferation¹⁵, Flavonoids which is one types of polyphenols is protect against oxidative stress¹⁶, Hydroxybenzoic acid is Anti-inflammatory¹⁷, Chlorogenic acid¹⁸ and Quercetin¹⁹ are Anti diabetic Components this might be responsible for improvement and maintained of visual acuity in the follow up period also.

CONCLUSION:

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The primary clinical challenge in this case was the preservation of visual function. Throughout the treatment duration, visual acuity remained stable in the left eye (OS) and showed measurable improvement in the right eye (OD). Fundus evaluation demonstrated a reduction in retinal hemorrhages and hard exudates in both eyes (OU). Additionally, macular edema in the right eye decreased. Along with these ocular improvements, a gradual reduction in blood glucose levels was observed during the treatment course, which may have contributed to better metabolic control and favorable retinal outcomes. On the basis of the observed outcomes or result it may be

inferred that ayurvedic therapeutic approaches are beneficial in addressing complication associated with Diabetic retinopathy.

DECLARATION OF PATIENT CONSENT

Patient has given his consent for reporting the case along with the images and other clinical information in the journal.

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Nil.

Reference:

- ¹ Khurana AK, Khurana A, Khurana B. **Comprehensive Ophthalmology**. 6th ed. New Delhi: Jaypee Brothers Medical Publishers; 2015. Chapter 12, Diseases of the Retina; p. 281–289.
- ² Bowling B. **Kanski's Clinical Ophthalmology**. 8th ed. Sydney: Elsevier; 2016. p. 520–535.
- ³ (Bowling B. *Kanski's Clinical Ophthalmology*. 8th ed. Sydney: Elsevier's Publications; 2016. p. 520.)
- ⁴ Vinos SA. Breakdown of the blood - Retinal barrier. In: *Encyclopedia of the Eye*. Cambridge: Academic Press; 2010.
- ⁵ Khurana AK, Khurana A, Khurana B. New Delhi: Jaypee Brothers Medical Publishers Pvt Ltd. 2015.
- ⁶ Sihota R, Tandon R. *Parsons' Diseases of the Eye*. 22nd ed. New Delhi: Elsevier Publications; 2015. p. 314.
- ⁷ *Netra prakashika of ayurveda Shatpannasara* by Dr. Udaya Shankar Chaturtha patala page no. 29
- ⁸ Shastri, K. A. D; *Sushruta Samhita (Part-2)*. Uttaratantra, Chapter 7, Verse 6, Varanasi, India: Chaukhamba Sanskrit Sansthan. Edited with Ayurved Tattva-Sandipikai, 2006, p. 32.
- ⁹ Shastri, K. A. D; *Sushruta Samhita (Part-2)*. Uttaratantra, Chapter 1, Verse 19, Varanasi, India: Chaukhamba Sanskrit Sansthan. Edited with Ayurved Tattva-Sandipikai, 2006, p. 10.
- ¹⁰ *Sushruta Samhita of Maharishi Sushruta with Ayurvedatattva Sandipika Hindi Commentary*, Uttara Tantra; Sarvagatarogavigyaniya Adhyaya. Ch.25,Varanasi: Chaukhamba Sanskrit Sansthan; 2015
- ¹¹ Bhavaprakash niganthu, Sri Bhavamishra, English commentary by Prof D. Shanthkumar Lucas 1st ed. Chaukhamba vishvabharti 2017, p 688, p162
- ¹² <https://myjournal.poltekkes-kdi.ac.id/index.php/hijp/article/view/719>
- ¹³ Slimani N., Deharveng G., Unwin I., Southgate D.A., Vignat J., Skeie G., Salvini S., Parpinel M., Møller A., Ireland J., et al. The EPIC nutrient database project (ENDB): A first attempt to standardize nutrient databases across the 10 European countries participating in the EPIC study. *Eur. J. Clin. Nutr.* 2007;61:1037–1056. doi: 10.1038/sj.ejcn.1602679. [DOI] [PubMed] [Google Scholar]
- ¹⁴ Chambial S., Dwivedi S., Shukla K.K., John P.J., Sharma P. Vitamin C in disease prevention and cure: An overview. *Indian J. Clin. Biochem.* 2013;28:314–328. doi: 10.1007/s12291-013-0375-3. [DOI] [PMC free article] [PubMed] [Google Scholar]
- ¹⁵ Borel P., Preveraud D., Desmarchelier C. Bioavailability of vitamin E in humans: An update. *Nutr. Rev.* 2013;71:319–331. doi: 10.1111/nure.12026. [DOI] [PubMed] [Google Scholar]
- ¹⁶ Pandey K.B., Rizvi S.I. Plant polyphenols as dietary antioxidants in human health and disease. *Oxid. Med. Cell Longev.* 2009;2:270–278. doi: 10.4161/oxim.2.5.9498. [DOI] [PMC free article] [PubMed] [Google Scholar]
- ¹⁷ Verma S., Singh A., Mishra A. Gallic acid: Molecular rival of cancer. *Environ. Toxicol. Pharmacol.* 2013;35:473–485. doi: 10.1016/j.etap.2013.02.011. [DOI] [PubMed] [Google Scholar]
- ¹⁸ Cho A.S., Jeon S.M., Kim M.J., Yeo J., Seo K.I., Choi M.S., Lee M.K. Chlorogenic acid exhibits anti-obesity property and improves lipid metabolism in high-fat diet-induced-obese mice. *Food Chem. Toxicol.* 2010;48:937–943. doi: 10.1016/j.fct.2010.01.003. [DOI] [PubMed] [Google Scholar]
- ¹⁹ Bischoff S.C. Quercetin: Potentials in the prevention and therapy of disease. *Curr. Opin. Clin. Nutr. Metab. Care.* 2008;11:733–740. doi: 10.1097/MCO.0b013e32831394b8. [DOI] [PubMed] [Google Scholar]