



Case Study

MANAGEMENT OF DIABETIC MACULAR EDEMA THROUGH AYURVEDA - A SINGLE CASE STUDY

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ABSTRACT

Diabetic macular edema is one of the leading causes of visual acuity loss in people with diabetes. It produces blurry vision, particularly in the centre of the vision field, floaters and black spots in front of the eyes etc. The treatment recommended by modern science is laser photocoagulation and anti-VEGF injection, which is pricey and does not ensure visual reversal in the patient. In Ayurveda text, diabetic retinopathy and diabetic macular edema are not directly described but etiopathogenesis of eye diseases and *Premeha* gives an idea of possible correlation between these two diseases. So, DME resembles *Timira (Pramehajanya)*. In Ayurveda, *Timira* has been explained in detail by our *Acharyas*. Clinical manifestations of *Timira* are *Vihwal Drishti* (blurred vision), *Makshika Mashaka Kesha Jaala Pashyati* (floaters), *Tamasa Darshanam* (Scotoma- black spots in front of eyes) and *Nasa Akshi Yuktani Vipritani Vikshate* (Metamorphopsia or distorted vision) which has similarity with features of DME. **Material & Methods:** In the present study, a female patient aged 51 years, visited the *Shalaky Tantra* OPD of National Institute of Ayurveda, Jaipur, with complaining of Blurriness of vision since 6 months and uncontrolled blood sugar level. **Result:** Blood sugar level was controlled and saw reduction in subjective and objective parameters. **Discussion:** Following an Ayurvedic drugs and routine will assist to slow the advancement of the condition, prevent further diabetes complications, and improve quality of life.

INTRODUCTION

Diabetes mellitus is a serious metabolic disorder, with a major impact on the lives and well-being of individuals, families and societies worldwide. The eye is considered as the primary target of hyperglycemia. Hyperglycemia develops diabetic retinopathy under the influence of prolonged hyperglycemia. Diabetic retinopathy is a leading cause of visual impairment. Diabetic Macular Edema (DME) is a potential complication of Diabetic Retinopathy (DR). It affects an estimated one in three people living with diabetes and is a primary cause of loss of vision and blindness in those aged between 20 to 65 years. Blurring of the central vision may be the first symptoms the patient notices.

Others important symptoms include appearance of spots in front of the eye – commonly called “floaters”, a shadow across the field of vision, eye pain or pressure, difficulty with color perception. Severity at diagnosis ranges from mild to complete loss of vision. DME involves the deterioration of the blood retinal barrier in the eye, and a resulting pooling of fluid within the retina’s central area. This capillary leakage causes diffuse edema, whereas focal or multifocal leakage from grouped microaneurysms leads to localized edema.

In Ayurveda, *Timira* has been explained in detail by our *Acharyas*. Clinical manifestations of *Timira* are *Vihwal Drishti* (blurred vision), *Makshika Mashaka Kesha Jaala Pashyati* (floaters), *Tamasa Darshanam* (Scotoma- black spots in front of eyes) and *Nasa Akshi Yuktani Vipritani Vikshate* (Metamorphopsia or distorted vision) which has similarity with features of DME. [1]

In the sequence of development of *Pramehajanya Timira*, excessive intake of *Achakshushya* and *Pitta* dominant *Aahara* and *Vihara* provokes *Pitta Dosh* along with *Kapha Dosh*, which later become *Vimargami* and ascends to *Urdhavjatra*

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Pradesha through *Sira* and *Ratkavaha Srotas* and especially vitiate *Rakta*, *Mansa* and *Medo Dhatu*. They cause obstruction to normal pathway of *Vata* which leads to aggravation of *Vata*. This *Vata* draws out vital constituents such as *Vasa*, *Majja* and *Apara Oja* which leads to depletion of *Dhatu*s from all part of the body. Hence, *Prameha* brings out changes first in *Sarva Sira*, then in *Dristipatalgata Sira* that leads to impairment of vision. Thus in Ayurveda we can consider it as *Timira Darshana (Premehajanya Timira)* and treat according to it.

In contemporary medical science few treatment modalities are available like Laser Photocoagulation, Pars-Plana Vitrectomy (PPV) surgery, some pharmacotherapies like intravitreal anti-vascular endothelial growth factor injections (anti VEGF injections), intravitreal steroids etc. but, these therapies do not provide satisfactory solution to the problem.^[2] Hence, it is the need of the hour to find out safe, effective and economic therapy in alternate systems of medicine which can decelerate the progression of disease and the risk of visual loss.

MATERIALS AND METHODS

A female patient aged 51 years, Registration no. 81623 visited the *Shalaky Tantra* OPD of National Institute of Ayurveda, Jaipur on 13 Sep 2021 with complaining of Blurriness of vision in both eyes for both distant and near vision, floaters and black spots in front of left eye since 6 month.

Past History: Nothing contributory.

Family History: Patient's mother was suffering from Type-2 Diabetes.

History of Present Illness: Patient gradually developed blurriness of vision for both distant and near objects. There were occasional floaters and black spots in front of left eye. For this she approached an Ophthalmologist, Found out that his blood sugar level was high and OCT was done and after her thoroughly examination, she was diagnosed having Diabetic Macular Edema in left eye. She was advised to take Intravitreal bevacizumab (0.5mg). Patient was not willing to undergo the above said treatment and wanted to give Ayurveda a try, thus she approached our OPD.

History of Past Illness: She is a known case of Diabetes mellitus since past 9 years and taking medications such as Glimepiride and Metformin.

Personal History

- Sleep: Disturbed
- Appetite: Good
- Bowel: Once a day
- Micturition: 5-6 times/ day

- Alcohol: No
- Tobacco chewing: No
- Smoking: No

General Examination

- Pulse rate: 72/min
- Respiratory rate: 18/min
- Blood pressure: 128/90mmHg
- Temperature: 98.6°F

Systemic Examination: All the systemic Examinations were within normal limits.

Ashta sthana pareeksha

- *Nadi*: 72/min
- *Mutra*: 5-6 times/day
- *Mala*: *Prakrta*
- *Jihwa*: *Prakrta*
- *Shabda*: *Prakrta*
- *Sparsha*: *Prakrta*
- *Drik*: *Vikrta*
- *Akriti*: *Madhyama*

Dashavidha Pareeksha

- Prakriti* a) *Sharira*: *Vata-Pittaja*
b) *Manasa*: *Rajasika*

Vikriti *Madhyama*

Satva *Madhyama*

Sara *Madhyama*

Sahanana *Madhyama*

Pramana *Madhyama*

Satmya *Madhyama*

Aharshakti *Madhyama*

Vyayamashakti *Avara*

Vaya *Madhya*

Ocular Examination

1. Face: Normal
2. Eyebrows: Normal
3. Orbits: Normal
4. Eyeballs: Normal
5. Eyelids: Normal
6. Eyelashes: Normal
7. Lacrimal sac: Normal
8. Conjunctiva: (i) Bulbar- Normal
(ii) Palpebral- Normal
9. Cornea: Normal
10. Sclera: Normal
11. Ant. Chamber: Normal
12. Iris: Normal
13. Pupil: Normal
Pupillary Reflex: RE Reactive
LE Reactive
14. Lens: IMSC in Both eyes
15. IOP: RE 15mm/Hg
LE 17mm/Hg

Table 1: Visual Acuity Test

	RE	LE
DVA	6/12P	6/60
NVA	N/8	N/10
PH	6/9	6/60

Table 2: Refraction

	RE				LE			
	SPH	CYL	AXIS	VISION	SPH	CYL	AXIS	VISION
Distance		-0.50	90	6/9	-6.50	-0.50	90	6/36
Near	+2.00	-	-	N/6	+2.00	-	-	N/8

Amsler Grid Test

Right Eye: Normal.

Left Eye: Patient visualized distorted lines in right upper and lower quadrants.

Table 3: Fundus Examination

Characters	RE	LE
Media	Hazy	Hazy
Disc <ul style="list-style-type: none"> • Size • Shape • Colour • Margins 	Normal Oval Shape Pinkish-Yellow Clear	Normal Oval Shape Pinkish-Yellow Clear
C:D Ratio	0.4	0.4
Macula <ul style="list-style-type: none"> • Foveal Reflex • Fixation 	DULL Normal	DULL Normal
General Background	Microaneurysms+	Hard Exudates++ Microaneurysms++ Haemorrhages+

Table 4: Laboratory Investigations

FBS	160 mg/dl
PPBS	180 mg/dl
HBA1C	8

Table 5: OCT -3D Macula Findings

Central Macular Thickness	RE	LE
	226 µm	322 µm

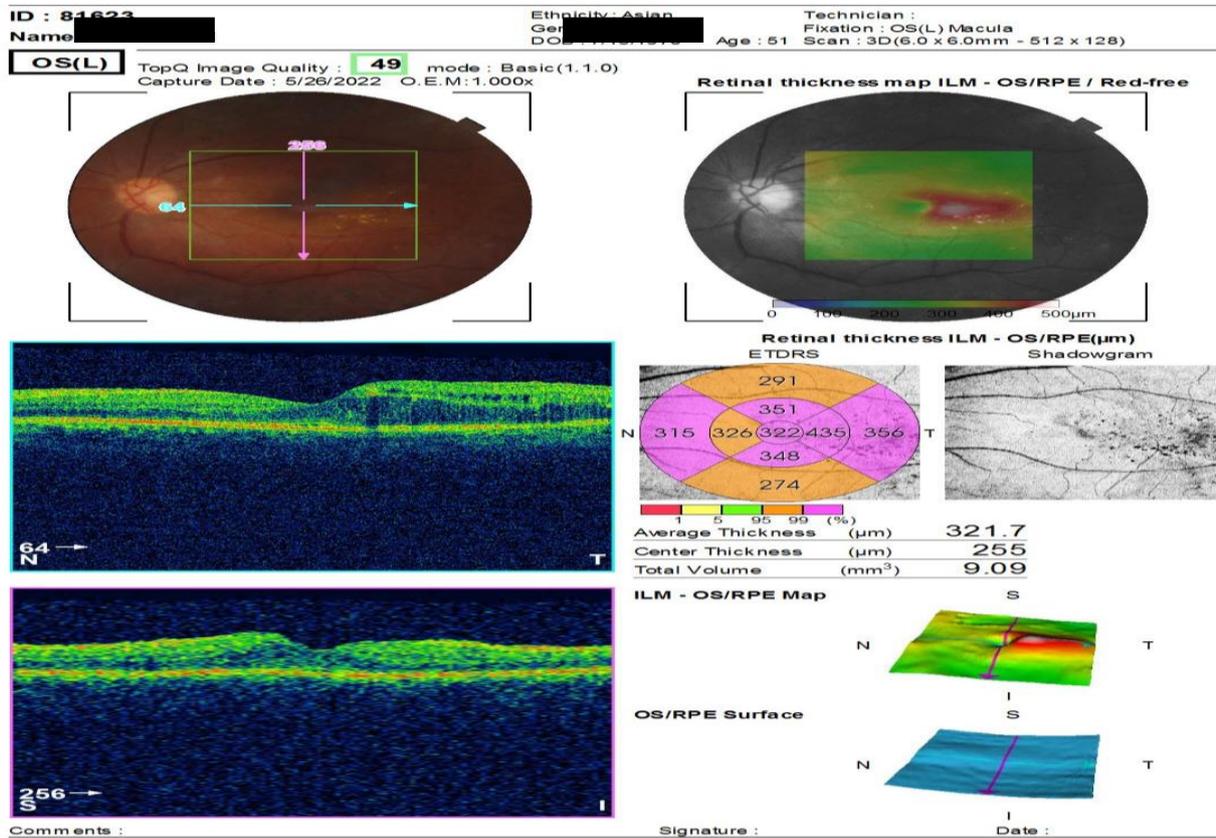


Figure: 1 OCT image of left eye showing macular edema

Treatment

After Examination of the patient, her consent was taken for the treatment and prognosis was explained in detail to her and her family members. She was treated in OPD basis. The total duration of the study was 45 days. The treatment plan is given in table no.6:

Table 6: Treatment Plan

S.No.	Date of Visit	Therapeutic Intervention		
		Medication	Duration	Dose
1.	First visit- 13-09-2021	Deepan & Pachana	First 5 days	Dhanayak-15gm Musta-10gm Shunthi-5 gm Boil in 2.5 liter water and boil until remains 2 liter. Then drink this water all over day.
2.	Start these medication from 18-09-2021	Punarnavadi Kwath with Anupana of Gomutra Arka	30 days	30ml with 10ml Gomutra Arka Two times a day Before food
		Triphala Guggulu	30 days	1gm thrice a day with lukewarm water after food
		VasaGuduchyadi Kasayam	30 days	20ml added with equal amount of water two times a day
		Chandraprabha vati	30 days	2 tablet twice a day with water
		Nisha- Amalki Churna	30 days	6 gm twice a day After food
		Madhumehari Churna	30 days	5 gm Twice a day After Breakfast in morning and after dinner in evening
3.	On the second visit 19-10-2021	There was some clarity in vision. So the same treatment was continue for 15 more days		

4.	On the Third visit 04-11-2021	There was an improvement in Visual acuity, a reduction in macular thickness in 3D OCT and some reduction found in value of FBS, PPBS and HbA1C level. <i>Chandraprabha Vati</i> was stopped and all other treatment was advised to take continuously for more 15 days.
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RESULT/OUTCOME

With the Ayurvedic treatment and following *Pathya Ahara Vihara*, There was subsequent clarity of vision.

Table 7: Visual Acuity changes

	RE	LE
DV_A	6/12	6/36
NV_A	N/8	N/8
PH	6/9	6/24

Table 8: Changes in Refraction

	RE				LE			
	SPH	CYL	AXIS	VISION	SPH	CYL	AXIS	VISION
Distance		-0.50	90	6/9	-6.00	-0.50	90	6/24
Near	+2.00	-	-	N/6	+2.00	-	-	N/6

Table 9: Changes in Fundus Examination

Macula		
<ul style="list-style-type: none"> • Foveal Reflex • Fixation 	Dull Normal	Dull Normal
General Background	Microaneurysms+	Hard Exudates+ Haemorrhages+

Table 10: Changes in Laboratory Investigations

FBS	120 mg/dl
PPBS	160 mg/dl
HBA1C	7.4

Table 11: Changes in OCT -3D Macula Findings

Central Macular thickness	RE	LE
	199µm	287 µm

OCT finding's shown macular thickness reduced to 287µm. It is given in 'Fig no: 2'.

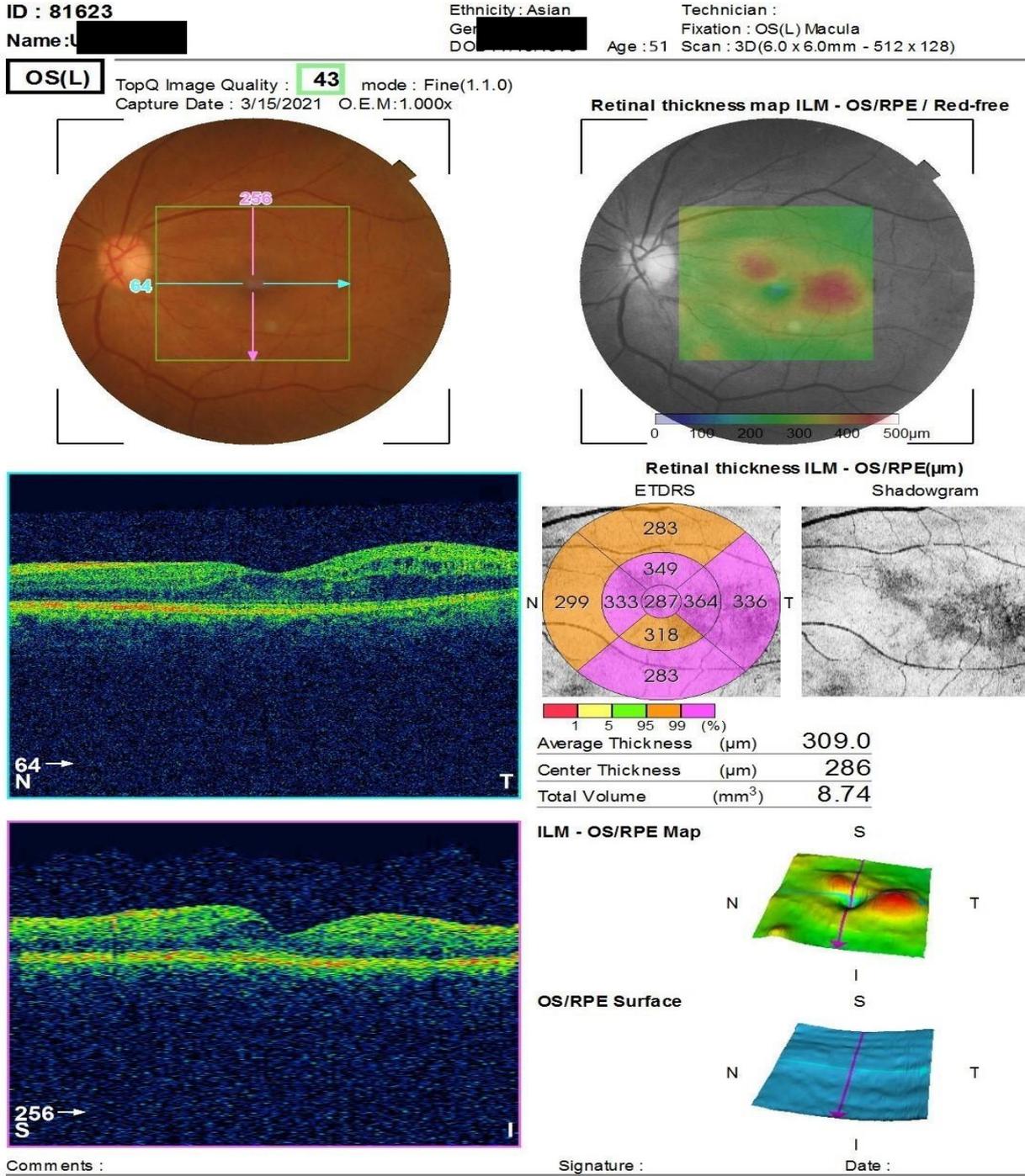


Fig.2 OCT image of left eye showing decrease of edema and macular thickness

DISCUSSION

Here in an Ayurvedic perspective, diabetic macular edema is occurred because of *Kapha Pitha* predominance and *Raktha Vaha Srotho Dushti*, which result in leakage and accumulation of fluid between the retinal layers. *Prameha* being a *Kapha pradhana vyadhi* increased *Kledathva* is also an underlying cause. So here we have adopted *Kapha Pitha Shamaka Chikitsa*, aiming for removal of *Srotha Avarodhana* and *Raktha Prasadana*. Other main aim of the treatment was to nullify the *Nidana* or *Samprapthi Vighatana* of the condition which is *Prameha* by advising *Aushadi's* for *Prameha* and following *Pathya* and *Vihara*.

Probable Mode of Action of Treatment Given

a) Deepana and Pachana

For removing the *Ama avastha*.

b) Premehahara Chikitsa

Mainly to treat the root cause of the disease, we had given internal medication to control the increased blood sugar level.

1. Chandra Prabha Vati: It contains *Shilajatu* which is *Sthairyra Kara* and *Kaphahara* and does *Lekhana* property. It reduces the edema by *Shothahara* property. It does *Rasayana* action also which helps in rejuvenating the damaged retinal vessels.

2. **Vasa Guduchaydi Kashaya:** It contains drugs such as *Vasa, Abhaya, Guduchi, Haritaki, Chirayata, Nimba, Kutakai, Amalaki* etc. It is having *Tikta Kashaya Rasa, Laghu* and *Ruksha Guna* and it is *Chakshushya* and *Raktha Pitha hara*.
3. **Nisha Amalaki Churna:** Main ingredients are *Haridra* and *Amalaki* which are having anti-oxidant property and mentioned in *Prameha chikitsa*.
4. **Madhumehari Churna:** It contains *Karvellaka, Gudmar, Methika, Bilva, Nimba, Sunthi, Saunfa, Sanai, Bala, Baboola*. It has anti-diabetic effect and it is a self-preparation of NIA Pharmacy.

c) **Shamana Aushadi's**

In DME formation, there is multiple disease pathological events taking place such as: *Prameha Samprapti, Raktapitta Samprapti* and *Shotha Samprati*. Hence for the control and management of *Pramehajanya Netra Upadrava* (Diabetic Macular Edema), *Pitta Kapha Rakta Shamaka* and *Shothahara* drugs will be beneficial.

Keeping this in view, the present study is undertaken by adopting oral administration of *Punarnavadi Kwath* and *Triphala Guggulu* as a *Shaman Aushadi*. Contains of both drugs having *Shothahara, Pramehanashak, Rasayana, Mootrala, Chakshushya* properties as well as hypoglycemic, anti-inflammatory and antioxidant potential and immunomodulatory effect.^[3] Because of these properties, it may clear the local fluid retention from retina and reduce the macular edema. Cow's urine (*Gomutra*) also has *Katu, Lavana, Tikta, Kasaya, Madhura Rasa, Ushna Virya, Tikshna, Laghu, Ruksha Guna & Kapha Shamak, Vatanulomaka, Pittanisarak* attributes. These are similar to those of eight herbs of *Punarnavadi Kwath*. It promotes urination so it helps in bio- purification. The re-distilled cow urine found to be having strong antioxidant property mainly by virtue of volatile fatty acids present in it which was also reported by some studies.^[4] Anti-diabetic effect (glucose lowering effect) of cow urine is might be due to stimulation of beta cells of pancreatic islets or stimulation of glycogenesis^[5] and also due to its anti-oxidant effect.^[6-7]

d) Pathya: She was advised to avoid *Madhura, Amla, lavana rasa* and to implement *Ahara* of *Tikta, Kashaya, Katu rasa*.

CONCLUSION

Diabetes is the main underlying reason behind macular edema. By adopting Ayurvedic protocols and making changes in *Dinacharya* and *Ahara Vihara*, will bring changes not only in the disease condition but also it upgrade the lifestyle of the person. Here we had adopted *Kapha Pitha hara Chikitsa* resulting in reduction of inflammation and removing the *Sangathva* of *Raktha Vaha Srotas* as it prevents further damage to retinal vessels.

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