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## Exudative Age-Related Macular Degeneration and Its *Ayurvedic* Management: A Case Series



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**Narayanan Namboothiri Narayanan<sup>1</sup>, Sreekala Nelliakkattu Parameswaran<sup>2</sup>, Aravind Kumar\*<sup>3</sup>, Krishnendu Sukumaran<sup>4</sup>, Kavya Rama Varma<sup>5</sup>**

<sup>1</sup>Chief Physician and President <sup>2</sup>Deputy Chief Physician and Vice-President <sup>3</sup>Research Coordinator <sup>4</sup>Research Coordinator <sup>5</sup>Junior Medical Officer Sreedhareeyam Ayurvedic Research and Development Institute Nelliakkattu Mana, Kizhakombu Koothattukulam, 686662, Ernakulam Dt., Kerala, India

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### ABSTRACT

**Introduction:** Exudative age-related macular degeneration (ARMD) accounts for 10% of the total number of cases of ARMD worldwide. Rapidly progressive marked vision loss is the hallmark of exudative ARMD. If not nipped in the bud, complications such as retinal detachment may occur. Clinical findings may be elucidated by slit-lamp biomicroscopy, fundus fluorescein angiography, and optical coherence tomography. As conventional methods of management may not always yield positive results, alternative options may be sought. **Case Presentation:** 3 cases of exudative ARMD were managed using specially tailored *Ayurvedic* oral medicines and therapies for both eyes and head at Sreedhareeyam Ayurvedic Eye Hospital and Research Center, India. Visual acuity (VA) showed marginal improvement and posterior segment examination showed significant improvement in all cases. **Discussion:** Analysis according to *Ayurvedic* principles revealed involvement of *Vata Dosha* (somatic humor responsible for movement) and *Pitta Dosha* (somatic humor responsible for anabolism) in the pathogenesis of the condition. Blurring of vision was correlated with *Timira*, a disease of vision. Treatments were aimed to treat the condition and normalize physiology. This holistic approach to the patient may make the management of exudative ARMD in *Ayurveda* an option to consider.



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## INTRODUCTION

Exudative ARMD, the leading cause of blindness from macular degeneration, is less prevalent than the non-exudative variety. The Framingham Eye Study estimated its prevalence to be 1.5% among the global population with a 7-fold increase in prevalence among the geriatric cohort.<sup>1</sup> Prevalence of exudative ARMD is more in women aged 75 and above as compared to men. Hypertension was found to be a risk factor for exudative ARMD in the second eye of individuals with ARMD in one eye at a baseline investigation. Clinical manifestations of exudative ARMD include sub-retinal fluid, macular edema, retinal, subretinal, or sub-retinal pigment epithelium (sub-RPE) hemorrhage, RPE tear or detachment, and disciform scar. Differential diagnosis is between angioid streaks, Best macular dystrophy, optic disc drusen, optic nerve head pits, pathological myopia, geographic choroiditis, and traumatic rupture of the choroid.

Treatment options include intravitreal anti-VEGF injections, photodynamic therapy, and trans-papillary thermal therapy, but these may not always prove effective. Hence, options in complementary and alternative medicine, including *Ayurveda*, may be sought.

## Methodology

Data of three patients of exudative age-related macular degeneration, and their specially tailored *Ayurvedic* treatments, was surveyed in this case series. Two of the patients were 63 years of age, while the third was 73 years. All three patients presented with distorted central vision, impaired ability for near work, and occasional floaters. The case series conforms to the internationally-developed Case Report (CARE) guidelines to ensure transparency and efficiency in health science reporting.<sup>4</sup> Institutional review board approval was not required to prepare this series; however, informed written consent was obtained from the patients for detailing their cases.

## Case 1

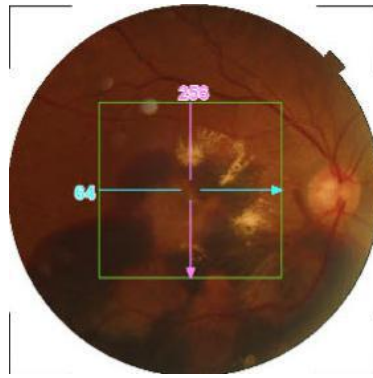
This non-diabetic and non-hypertensive patient's symptom started in her right eye (OD) one year previously. When she first experienced distortion of vision, she neglected it as she was preoccupied with domestic problems. Vision gradually deteriorated to the point where reading was impaired. Floaters were occasional. She was diagnosed with exudative age-related macular degeneration by an ophthalmologist, but denied to undergo conventional management. She approached one of Sreedhareeyam Eye Hospital's branch centers, where

she was advised inpatient admission at the hospital's main center. Her 3 siblings are diabetics who are under medication. Personal history (bowel, appetite, micturition, sleep) were normal, and social history was negative for addictions or allergies. Her general examination, review of systems, and vital signs were normal.

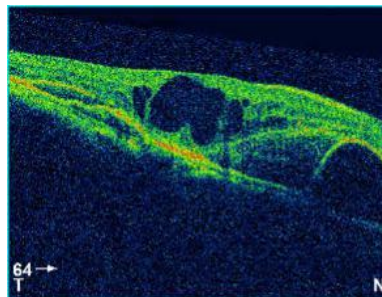
Unaided distant visual acuity (DVA) at admission for the first course of treatment was LogMAR 1.1 OD and LogMAR 0.477 OS; aided DVA was LogMAR 0.602 OD and LogMAR 0.477 OS, and near visual acuity (NVA) was N36 OU. Anterior segment examination OU was normal. Pupillary examination OU showed normal responses to both direct and consensual light reflexes.

Posterior segment examination by direct ophthalmoscopy and fundus photography showed a dull foveal reflex, choroidal neovascularization, and vitreous hemorrhage OD (**Figure 1a**). Optical coherence tomography (OCT) macula OD showed cystoid macular edema (**Figure 1b**). She underwent 3 courses of inpatient treatment.

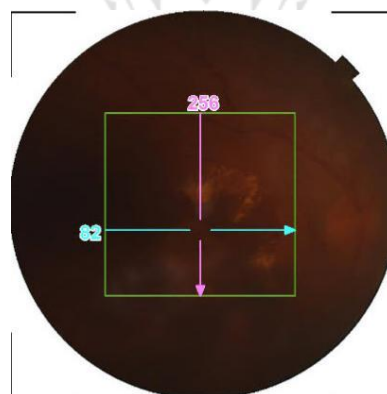
At discharge after her first course of treatment, her unaided DVA was LogMAR 1.1 OD and LogMAR 0.477 OS; aided DVA was LogMAR 0.602 OD and LogMAR 0 OS; and NVA was N24 OD and N18 OS. Posterior segment examination showed absorption of the vitreous hemorrhage (**Figure 1c**) and OCT macula demonstrated reduction in the cystoid lesions (**Figure 1d**). She was prescribed medicines and advised for regular follow-ups. A follow-up consultation on April 3<sup>rd</sup>, 2017 demonstrated an unaided DVA of LogMAR 1 OD and LogMAR 0.77 OS with the other readings maintained. At admission for her second course of treatment, unaided DVA was LogMAR 0.778 OD and LogMAR 0.477 OS; aided DVA was LogMAR 0.176 OU; NVA was N18 OU, and posterior segment examination and OCT macula were not done. At discharge, the VA readings were maintained; posterior segment examination showed further absorption of vitreous hemorrhage OD (**Figure 1e**), and OCT macula showed resolution of macular edema (**Figure 1f**). At admission for her third course of treatment, unaided DVA was LogMAR 1 OD and LogMAR 0.778 OS; aided DVA was LogMAR 0.477 OD and LogMAR 0.301 OS, and NVA was N18 OU. The same readings were maintained at discharge.



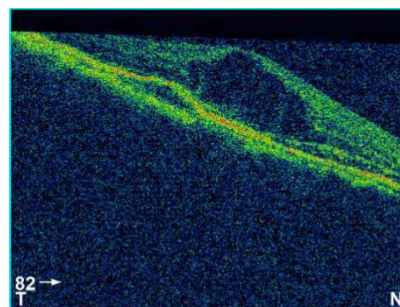
**Figure No. 1a:** Posterior segment examination OD at admission to the first course of treatment



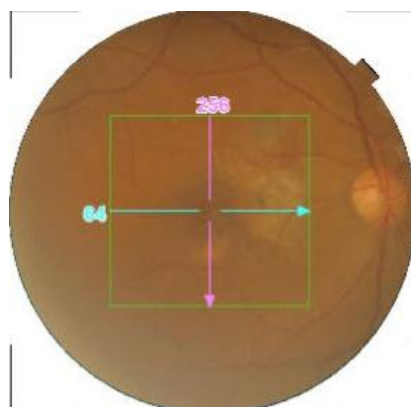
**Figure No. 1b:** OCT macula OD at admission to the first course of treatment



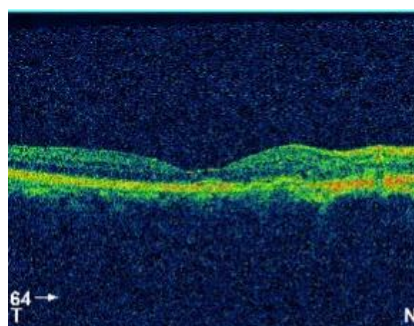
**Figure No. 1c:** Fundus examination OD at discharge after the first course of treatment



**Figure No. 1d:** OCT macula OD at discharge after the first course of treatment



**Figure No. 1e:** Posterior segment examination OD at discharge after the second course of treatment



**Figure No. 1f:** OCT macula OD at discharge after the second course of treatment

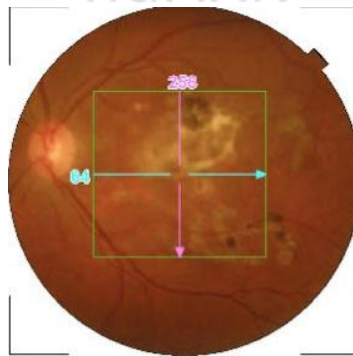
## Case 2

When this female first experienced the symptoms, she had an ophthalmic consultation, where she was diagnosed with exudative ARMD and was prescribed injection of anti-vascular endothelial growth factors (anti-VEGF). Six rounds of injection with Avastin® and one round of injection with Accentrix did not yield positive results. Pan-retinal LASER photocoagulation, which was conducted later, also did not yield positive results. Her immediate family members do not report similar ophthalmic complaints. Her bowel, appetite, and micturition are normal, and her sleep is sound. She does not report any addictions. Her general physical and systemic examination was normal, and all vital signs were within normal ranges.

Unaided distant visual acuity (DVA) was LogMAR 0.602 OD and LogMAR 1.477 in her left eye (OS); aided DVA was LogMAR 0.176 OD and LogMAR 1.477 OS, and near visual acuity (NVA) was N18 in both eyes (OU). Anterior segment examination OU showed normal findings. Pupillary examinations showed normal responses to both direct and consensual

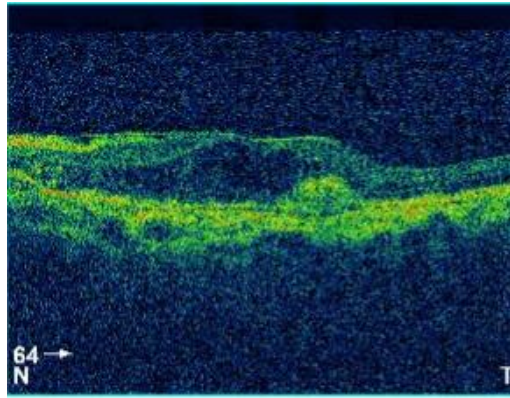
reflexes OU. Posterior segment examination showed an old macular scar, hemorrhages, and choroidal neovascularization OS (**Figure 2a**). OCT scanning OU showed macular edema (**Figures 2b**). She underwent 3 courses of treatment.

Unaided and aided DVA and NVA were maintained at the end of the first course of treatment, and the same results were noted at admission before the second course of treatment. Posterior segment examination at admission for the second course of treatment showed a macular scar and reduction in choroidal neovascularization OS (**Figure 2c**), while OCT macula showed reduction in macular edema OS (**Figures 2d**). At discharge after the second course of treatment, unaided DVA improved to LogMAR 0.778 OD and LogMAR 1.778 OS; and aided DVA was maintained at LogMAR 0.176 OD and improved to LogMAR 1.778 OS. Posterior segment examination OS showed reduction in neovascularization (**Figure 2e**). OCT macula OS showed reduction in macular edema. (**Figure 2f**) At admission for her third course of treatment, unaided DVA was LogMAR 0.778 OD and LogMAR 1.778 OS; while aided DVA was LogMAR 0.176 OD and LogMAR 1.778 OS. Posterior segment examination and OCT macula were not done at admission. VA readings were maintained at discharge. Posterior segment examination OS showed resolution of choroidal neovascularization (**Figure 2g**) and OCT macula OS showed reduction in macular edema. (**Figure 2h**)

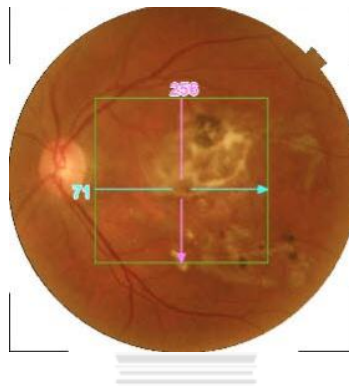


**Figure No. 2a:** Posterior segment examination OS at admission before the first course of treatment.

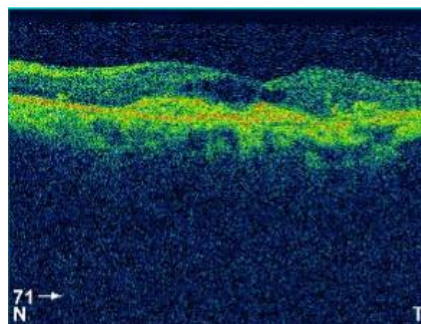




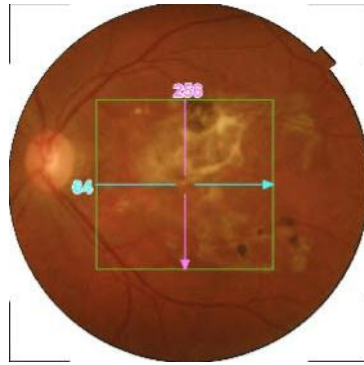
**Figure No. 2b:** OCT macula OS at admission before the first course of treatment



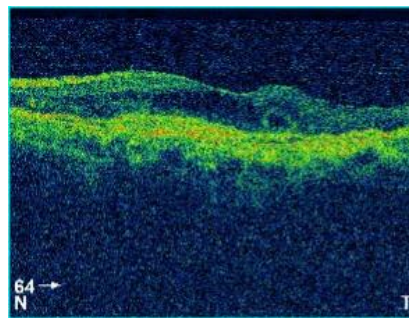
**Figure No. 2c:** Posterior segment examination OS after the second course of treatment



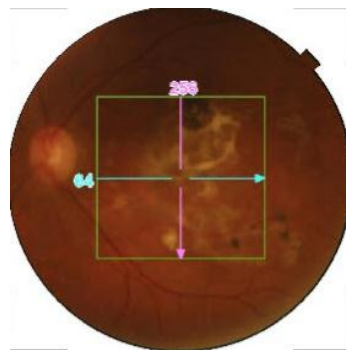
**Figure No. 2d:** OCT macula OS after the second course of treatment



**Figure No. 2e:** Posterior segment examination OS at discharge after the second course of treatment

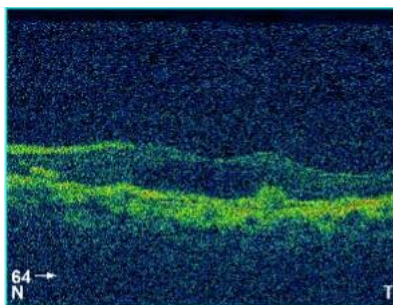


**Figure No. 2f:** OCT macula OS at discharge after the second course of treatment



**Figure No. 2g:** Posterior segment examination OS at discharge after the third course of treatment





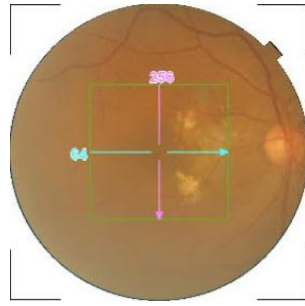
**Figure No. 2h:** OCT macula OS at discharge after the third course of treatment

### Case 3

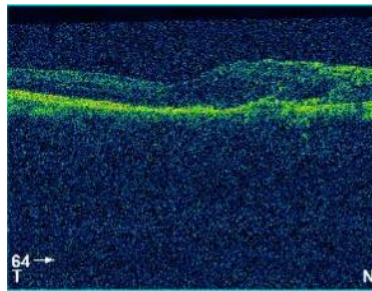
This female presented with a 7-year history of the symptoms OD. She developed distortion of images OD in 2012. An ophthalmologist prescribed glasses, which she started using. Blurring of vision increased, for which she consulted another ophthalmologist and was diagnosed with exudative ARMD, macular edema and hemorrhage. She underwent 1 injection of Avastin<sup>®</sup> and her vision improved. In 2015, her vision started blurring and she underwent 4 more rounds of injection of Avastin<sup>®</sup>, which provided no relief. None of her immediate family members report similar complaints. Her social history is normal and her vital signs are within normal limits.

Unaided DVA was LogMAR 0.778 OD and LogMAR 0.602 OS, aided DVA was 0.176 OU, and NVA was N12 OD and N6 OS. Anterior segment examination OU was normal. Pupillary examination OU showed sluggish responses to both direct and consensual light reflexes. Posterior segment examination OD showed drusen, macular degeneration, and attenuation of blood vessels. **(Figure 3a)** OCT scanning OD showed macular edema. **(Figure 3b)** She was admitted for a 14-day course of inpatient management.

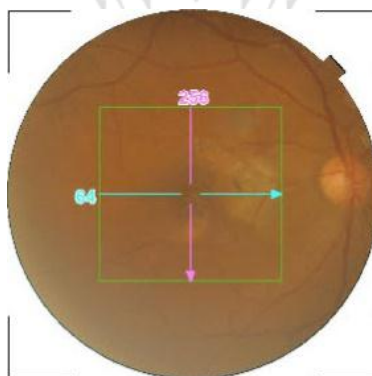
VA was maintained across all three parameters (unaided DVA, aided DVA, NVA), both at discharge and at 3 subsequent follow-ups. Posterior segment examination showed a more visible foveal reflex OD **(Figure 3c)** and OCT scanning showed absorption of the macular edema **(Figure 3d)**. A follow-up consultation showed a decreased DVA to LogMAR 1 OD, while the other readings were maintained. Two subsequent follow-ups were for renewal of prescriptions. The same VA readings were maintained at two more follow-ups.



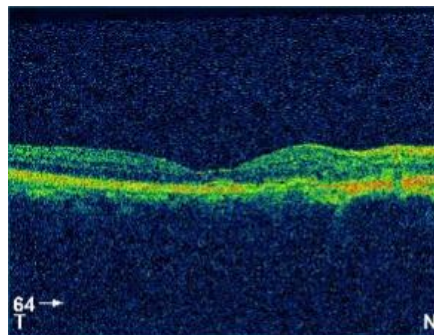
**Figure No. 3a:** Posterior segment examination OD at admission



**Figure No. 3b:** OCT macula OD at admission



**Figure No. 3c:** Posterior segment examination OD in 2019



**Figure No. 3d:** OCT macula OD in 2019

### Additional Information

Vulnerability assessment conducted before treatment grouped the patients into the geriatric cohort with visual deficits. There was no history of trauma, loss of consciousness, disorientation, or impaired judgment, and the patients were able to carry out their daily activities without hindrances.

The patients' treatment protocols were tailored to their *Ashta Sthana Pariksha* (8 methods of assessment)<sup>2</sup> and *Dasavidha Pariksha* (10 methods of assessment),<sup>3</sup> (Table 1) and included oral medicines (Table 2) and external therapies for eyes (*Kriyakalpa*) and head (Table 3).

*Panchakarma* (five bio-cleansing procedures), generally a requirement for ophthalmic and systemic disorders, were not performed due to the advanced age of the patients and the pathophysiology of the disease.

Timeline of events for the three cases are provided in Tables 4-6.

All medicines, except Chiniumco and Alert Capsule, were manufactured at Sreedhareeyam Farmherbs India, Pvt. Ltd., the hospital's Good Manufacturing Practices (GMP)-certified medicine manufacturing unit. Alert Capsule was manufactured at Vasu Healthcare Pharmaceuticals, Vadodara, Gujarat, India. Chiniumco was manufactured by J & J Dechane Laboratories, Pvt., Ltd., Hyderabad, Telangana State, India.

Table No. 1: Diagnostic Protocols			
Parameter	Patient 1	Patient 2	Patient 3
<b><i>Ashtasthana Pariksha</i> (8 methods of examination)</b>			
<b><i>Nadi</i> (pulse)</b>	<i>Kapha Pitta</i>	<i>Vata Pitta</i>	<i>KaphaVata</i>
<b><i>Mutra</i> (urine)</b>	<i>Prakrta</i>	<i>Prakrta</i>	<i>Prakrta</i>
<b><i>Mala</i> (excreta)</b>	<i>Prakrta</i>	<i>Prakrta</i>	<i>Prakrta</i>
<b><i>Jihva</i> (tongue)</b>	<i>Anupalipta</i>	<i>Anupalipta</i>	<i>Anupalipta</i>
<b><i>Sabda</i> (sound)</b>	<i>Prakrta</i>	<i>Prakrta</i>	<i>Prakrta</i>
<b><i>Sparsa</i> (touch)</b>	<i>Anushnasita</i>	<i>Anushnasita</i>	<i>Anushnasita</i>
<b><i>Drk</i> (sight)</b>	<i>Vaikrta</i>	<i>Vaikrta</i>	<i>Vaikrta</i>
<b><i>Akrti</i> (appearance)</b>	<i>Prakrta</i>	<i>Prakrta</i>	<i>Prakrta</i>

<b>Dasavidha Pariksha (10 methods of examination)</b>			
<b>Prakrti (somatic constitution)</b>	<i>Kapha Pitta</i>	<i>Pitta Kapha</i>	<i>KaphaVata</i>
<b>Vikrti (status of disease)</b>	❖ <i>Dosha: Vata, Pitta</i> ❖ <i>Dhatu: Rasa, Rakta</i>	❖ <i>Dosha: Vata, Pitta</i> ❖ <i>Dhatu: Rasa, Rakta</i>	❖ <i>Dosha: Vata, Pitta</i> ❖ <i>Dhatu: Rasa, Rakta</i>
<b>Sara (essence of Dhatus)</b>	<i>Rakta</i>	<i>Mamsa</i>	<i>Rakta</i>
<b>Samhanana(compactness of body parts)</b>	<i>Pravara</i>	<i>Madhyama</i>	<i>Madhyama</i>
<b>Pramana (measurement of body parts)</b>	<i>Madhyama</i>	<i>Madhyama</i>	<i>Madhyama</i>
<b>Sattva (psyche)</b>	<i>Pravara</i>	<i>Madhyama</i>	<i>Madhyama</i>
<b>Satmya (habituation)</b>	<i>Pravara</i>	<i>Madhyama</i>	<i>Madhyama</i>
<b>Ahara Sakti (capacity of digestion)</b>	<i>Madhyama</i>	<i>Madhyama</i>	<i>Madhyama</i>
<b>Vyayama Sakti (capacity for exercise)</b>	<i>Madhyama</i>	<i>Avara</i>	<i>Madhyama</i>
<b>Vaya (age)</b>	<i>Jirna</i>	<i>Jirna</i>	<i>Jirna</i>

<b>Table No. 2: Oral Medicines</b>									
<b>Medicine</b>	<b>Dosage</b>	<b>Post-Prandial Beverage</b>	<b>Time</b>	<b>Case</b>	<b>Prescription</b>	<b>Duration</b>	<b>Pharmacology: Modern</b>	<b>Pharmacology: Ayurveda</b>	
<b>Amrtottaram Kvatha</b>	60 mL	Boiled and cooled water	Twice a day before food	1	OP	2 months	❖ Antioxidant ❖ Cytoprotective ❖ Retinoprotective	❖ <i>Tridosha Hara</i> ❖ <i>Rakta Prasadana</i> ❖ <i>Dipana, Pacana</i> ❖ <i>Sroto Sodhana</i>	
					IP No. 1	17 days			
					2	IP No. 1			17 days
<b>Candrabha Vati</b>	1 tablet	<i>Amrtottaram Kvatha</i> <i>Samira Pancakam Kvatha*</i>		1	IP		❖ Free-radical scavenging ❖ Antioxidant ❖ Antidiabetic	❖ <i>Tridosha Samana</i> ❖ <i>Balya</i> ❖ <i>Dipana and Pacana</i> ❖ <i>Prameha Hara</i> ❖ <i>Mutrala</i> ❖ <i>Lekhana</i>	
					1	IP No. 1			17 days
					1	Discharge after IP No. 2			2 months
					IP No. 3	15 days			

<b>Chiniu mco<sup>o</sup></b>	1 tablet	Boiled and cooled water	Twice a day after food	<b>1</b>	Discharge after IP No. 1	2 months	❖ Anti-patelet and anticoagulant ❖ Antioxidant ❖ Scavenges free radicals ❖ Hypoglycemic ❖ Anti-diabetic	❖ <i>Pitta Kapha Hara</i> ❖ <i>Rakta Stambhaka</i> ❖ <i>Rakta Prasadana</i>
					Discharge after IP No. 3			
				<b>3</b>	OP No. 1	2 months		
					OP No. 2	2 months		
<b>Triphala Guggulu</b>	1 tablet	Boiled and cooled water	Twice a day after food	<b>1</b>	IP No. 1	17 days	❖ Antioxidant  ❖ Anti-diabetic	❖ <i>Kapha Vata Samana</i>  ❖ <i>Medo Hara</i> ❖ <i>Dipana</i>  ❖ <i>SrotoSodhana</i>
					<b>2</b>	IP No. 3		
				Discharge after IP No. 1		2 months		
				Discharge after IP No. 3	2 months			
<b>Drakshadi Kvatha</b>	15 mL	Boiled and cooled water	Twice a day before food	<b>1</b>	Discharge after IP No. 1	2 months	❖ Antioxidant  ❖ Anti-diabetic  ❖ Antibacterial	❖ <i>Pitta Vata Samana</i>  ❖ <i>Rakta Stambhaka</i>  ❖ <i>Rakta Prasadana</i> ❖ <i>Anulomana</i>
					<b>2</b>	IP No. 1		
	IP No. 2			19 days				
	IP No. 3			17 days				
	Discharge after IP No. 2			2 months				
	Discharge after IP No. 3			2 months				
60 mL								
<b>Saptamrta Lauha</b>	1 tablet	Boiled and cooled water	Twice a day after food	<b>2</b>	IP No. 1	17 days	❖ Antioxidant  ❖ Anti-diabetic	❖ <i>Tridosha Hara</i>  ❖ <i>RaktaPrasadana</i>  ❖ <i>Rasayana</i>
					IP No. 2	19 days		
					IP No. 3	17 days		

					Discharge after IP No. 2	2 months		❖ <i>Cakshushya</i> ❖ <i>Timira Hara</i>
					Follow-up No. 1	2 months		
					Discharge after IP No. 3	2 months		
<b>Alert Capsule<sup>^</sup></b>	1 tablet	Boiled and cooled water	Twice a day before food	<b>2</b>	IP No. 1	17 days	❖ Antioxidant	❖ <i>Kapha Vata Samana</i>
					IP No. 2	19 days	❖ Anti-diabetic ❖ Neuroprotective	❖ <i>Medhya</i>
<b>Punarnavadi Kvatha</b>	30 mL	<i>Samira Pancakam Kvatha*</i>	Twice a day before food	<b>1</b>	Discharge after IP No. 3	2 months	❖ Anti-diabetic ❖ Antioxidant	❖ <i>Kapha Pitta Samana</i> ❖ <i>Dipana</i>
	15 mL	Boiled and cooled water			<b>2</b>	Discharge after IP No. 1	2 months	❖ Hypoglycemic ❖ Anti-hyperglycemic ❖ Anticoagulant
<b>Bharngyadi Kvatha</b>	60 mL	Boiled and cooled water	Twice a day before food	<b>2</b>	Discharge after IP No. 1	2 months	❖ Antioxidant ❖ Anti-diabetic ❖ Neuroprotective ❖ Anti-hyperglycemic	❖ <i>Tridosha Samana</i> ❖ <i>Dipana</i> ❖ <i>Pacana</i>
<b>Samira Pancakam Kvatha*</b>	60 mL	Boiled and cooled water	6 am and 6 pm	<b>1</b>	OP	2 months	❖ Antioxidant ❖ Ophthalmic	❖ <i>Pitta-Kapha Hara</i> ❖ <i>Rakta Prasadana</i>
					Follow-up No. 1	2 months		❖ <i>Sroto</i>



					IP No. 2	14 days		<i>Sodhana</i> ❖ <i>Cakshushya</i>
					IP No. 3	15 days		
	30 mL	<i>PunarnavadiKvatha</i>			Discharge after IP No. 3	2 months		
	60 mL	Boiled and cooled water		3	Discharge	2 months	❖	
					Follow-up No. 2			
					Follow-up No. 3			
<b><i>Sudarsana Curna</i></b>	5g	Boiled and cooled water	Twice a day before food	1	OP No. 1	2 months	❖ Antioxidant	❖ <i>Tridosha Samana</i> ❖ <i>Pacana</i> ❖ <i>Koshta Suddhikara</i>
					Follow-up No. 1	2 months		
				3	IP			
<b><i>Vara Churna</i></b>	5g	Boiled and cooled water	Twice a day after food	1	Discharge after IP No. 1	2 months	❖ Antioxidant	❖ <i>Kapha Pitta Samana</i>
				2	Discharge after IP No. 1	2 months	❖ Anti-diabetic	❖ <i>Dipana</i> ❖ <i>Rasayana</i> ❖ <i>Sroto Sodhana</i> ❖ <i>Cakshushya</i>
					Discharge after IP No. 2	2 months		
				3	OP No. 1	2 months		
					OP No. 2	2 months		
					Follow-up No. 1	2 months		
					Follow-up No. 2	2 months		

					Follow-up No. 3	2 months			
<b>Akshabi jadi Capsule *</b>	1 capsule	Boiled and cooled water	Twice a day after food	<b>1</b>	Follow-up No. 1	2 months	❖ Antioxidant ❖ Scavenges free radicals ❖ Anti-diabetic	❖ <i>Tridosha Samana</i> ❖ <i>Dipana-Pacana</i> ❖ <i>Srotosodhana</i>	
					<b>3</b>	OP No. 1			2 months
						OP No. 2			2 months
						Follow-up No. 2			2 months
						Follow-up No. 4			2 months
<b>Ophtha Cap*</b>	1 tablet	Boiled and cooled water	Twice a day after food	<b>1</b>	Discharge after IP No. 2	2 months	❖ Ophthalmic ❖ Antioxidant	❖ <i>Pitta Kapha Hara</i> ❖ <i>Dipana</i> ❖ <i>Srotosodhana</i>	
<b>Avipatti Curna</b>	5g	Boiled and cooled water	Morning after food, once a week	<b>2</b>	Discharge after IP No. 3	2 months	❖ Antioxidant ❖ Anti-diabetic ❖ Hypoglycemic	❖ <i>Pitta Kapha Samana</i> ❖ <i>Dipana</i> ❖ <i>Virtecana</i> ❖ <i>Srotosodhans</i>	
<b>Pathya Punarnavadi Curna</b>	5g	Boiled and cooled water	Morning after food	<b>2</b>	Discharge after IP No. 3	2 months	❖ Antioxidant ❖ Anti-diabetic ❖ Hypoglycemic	❖ <i>Kapha Vata Samana</i> ❖ <i>Dipana-Pacana</i> ❖ <i>Sroto Sodhana</i>	
<b>Manasa Mitra Vataka</b>	1 tablet	Boiled and cooled water	At night after food	<b>2</b>	Discharge after IP No. 3	2 months	❖ Antioxidant ❖ Neuroprotective	❖ <i>Tridosha Hara</i> ❖ <i>Balya</i> ❖ <i>Srotosodhana</i>	

<i>Pathya Shadanga Kvatha</i>	15 mL	Boiled and cooled water	Twice a day before food	2	Discharge after IP No. 1	2 months	❖ Antioxidant ❖ Anti-diabetic ❖ Ophthalmic	❖ <i>Kapha Pitta Samana</i> ❖ <i>Anulomana</i> ❖ <i>Cakshushya</i>
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**Table No. 3: External Therapies Prescribed to the Three Patients with their Probable Mode of Action**

Treatment	Medicine	Case	Prescription	Duration	Manufacture of Medicine and Procedure of Therapy	Probable Mode of Action
<i>NetraDhara</i>	<i>Kasyapam Kvatha*</i>	1	IP No. 1	12 days	❖ The patient lay supine and was asked to blink as the lukewarm decoction was poured in a thin stream from a height of 2 inches over the eyes.	❖ Both procedures stimulated peripheral nerve endings, enhanced local circulation, irrigated obstructive lesions, and facilitated faster mobilization and expulsion of toxins. Height and temperature also facilitated action.
			IP No. 2	6 days		
			IP No. 3	5 days		
	Decoction of <i>Symplocosracemosus</i> Roxb.	2	IP No. 1	19 days		
			IP No. 1	10 days		
			IP No. 2	19 days		
<i>Mrdvikadi Kvatha*</i>	2	IP No. 1	17 days			
		IP No. 3	17 days			
<i>Seka</i>	<i>Kasyapam Kvatha*</i>	3	IP	15 days	❖ The patient lay supine and the lukewarm decoction was poured in a thin stream from a height of 2 inches over the closed eyes.	❖ The medicines stimulated local nerves and blood vessels and prepared the eye for further treatments.

<b>Bidalaka</b>	<i>Mukkadi Purampada</i> and <i>Karutta Gutika</i>	1	IP No. 1	14 days	❖ One tablet of both medicines was grounded and mixed with water to obtain a paste. This was applied over the eyelids while obviating the eyelashes.	❖ The paste and poultice exerted gentle pressure over the eyelids while a counter-pressure was exerted from the eyeball.
		2	IP No. 1	5 days		
			Discharge after IP No. 3	2 months		
<b>Pindi</b>	<i>Mukkadi Purampada, Amalaki Churna</i>	1	IP No. 1	12 days	❖ A semisolid paste was prepared by mixing the ingredients with water. This was tied in two cotton pads and placed over the closed eyes.	❖ This pressure enabled absorption of exudative secretions in the macula and facilitated its return to normalcy.
	Leaves of <i>Emblicaofficinalis</i> Gaertn. and oil of <i>Azadirachta Indica</i> A. Juss.	2	IP No. 1	7 days		
			IP No. 2	19 days		
<b>NetraPichu</b>	<i>Nimbamrtadi ErandaTaila</i> and <i>Vinayakanjana</i> *			19 days	❖ The medicine was instilled into two pieces of cotton, which were kept over the eyes	
<b>Bandhana</b>	Flowers of <i>Jasminumgrandiflorum</i> Linn.	3	IP	9 days	❖ The flowers were placed with their stems pointing upwards on two pieces of cotton. This was placed in a gauze bandage and put over the eyes.	❖ The cooling nature of the flowers relaxed the eye and cooled it down.
<b>PratimarsaNasya</b>	<i>Anutaila</i>	1	IP No. 3	3 days	❖ The patient lay supine and two drops of the medicine was instilled into	❖ Instillation of medicine through the nose stimulated
	<i>Kshirabala</i> 21 <i>Avartana</i>			3 days		
	Cephagraine Drops^	3	IP	7 days		

					each nostril.	local blood vessels, which resulted in expulsion of morbid matter from the head.
<b>Ascyotana</b>	Drops of <i>Veroniacinerea</i> Linn.	1	IP No. 1	6 days	<p><b>Procedure of Ascyotana and Anjana:</b></p> <p>❖ The patient lay supine and one drop of the medicine was instilled into the sub-conjunctival sac. The patient was asked to slowly rotate the eyes after instillation with the eyes closed.</p>	<p>❖ The drug fell on the conjunctiva and cornea from a safe height. It also had access to the conjunctival circulation.</p> <p>❖ 80% of the medicine was absorbed through the ocular layers.</p> <p>❖ Medicines dropped continuously from a height slightly increased the temperature and allowed faster absorption and less disposal.</p> <p>❖ Penetration to deeper structures was facilitated by bypassing the ocular barriers because of topical</p>
	Drops of <i>Veroniacinerea</i> Linn., <i>Ocimum sanctum</i> Linn., and honey	1	IP No. 1	11 days		
	<i>Vinayakanjana</i> *	1	IP No. 1	7 days		
			Discharge after IP No. 3	2 months		
		2	Discharge after IP No. 2	2 months		
			IP No. 3	7 days		
	<i>Jatavedha Ghrita</i> *, <i>Vinayakanjana</i> *, honey	1	IP No. 2	8 days		
	Drops of <i>Veroniacinerea</i> Linn. And honey	2	IP No. 1	12 days		
	<i>Kasyapa Ghrita</i> *	3	IP	7 days		
	Eye Plus*	1	Discharge after IP No. 1	2 months		
3			OP No. 1	2 months		
		OP No. 2	2 months			
		Follow-up No. 1	2 months			
Follow-up No. 2	2 months					

			Follow-up No. 3	2 months	<p>application.</p> <ul style="list-style-type: none"> <li>❖ The medicines improved eyesight and strengthened the eyes. The cooling nature of the medicines corrected the pathology.</li> <li>❖ Further penetration into the retina facilitated more absorption of fluid and corrected the retinal blood vessels.</li> </ul>
<i>Anjana</i>	<i>Netramrtam*</i>	<b>1</b>	IP No. 1	13 days	
			Discharge after IP No. 3	2 months	
		<b>2</b>	Discharge after IP No. 1	2 months	
			Follow-up No. 1	2 months	
			IP No. 3	17 days	
		<i>Netra Sudha*</i>	<b>1</b>	Discharge after IP No. 1	
	<b>2</b>			Discharge after IP No. 1	
			IP No. 2	19 days	
	<b>3</b>		IP No. 3	17 days	
			Discharge after IP No. 3	2 months	
			Follow-up No. 1	2 months	
			Follow-up No. 2	2 months	
		Follow-up No. 3	2 months		
	<i>Candanadi Anjana*</i>	<b>1</b>	Follow-up 1	2 months	
			IP No. 2	14 days	
Discharge			2		



			after IP No. 2	months		
		<b>2</b>	Discharge after IP No. 2	2 months		
			Follow-up No. 1	2 months		
		<b>3</b>	Discharge	2 months		
	<i>Nalikeranjana</i>	<b>1</b>	Follow-up 1	2 months		
		<b>3</b>	IP	13 days		
<b>Tarpana</b>	<i>Jatavedha Ghrta*</i> and <i>Vinayakanjana</i>	<b>1</b>	IP No. 2	3 days	<ul style="list-style-type: none"> <li>❖ Two circular fences made of gram flour dough were placed on the orbital margins.</li> <li>❖ Lukewarm ghee was instilled into the cavities and the patient was asked to slowly blink.</li> </ul>	<ul style="list-style-type: none"> <li>❖ High bioavailability, extended tissue contact time, and amphipathic nature of ghee enabled more penetration into deeper structures.</li> <li>❖ Blinking mechanism of the eyelids facilitated a lipophilic corneal stroma for penetration of the lipid.</li> <li>❖ The ingredients of the <i>ghee</i> enabled absorption of exudative secretions and normalized retinal blood</li> </ul>
	<i>Kasyapa Ghrta*</i> and <i>Jatavedha Ghrta*</i>		IP No. 3	7 days		
	<i>Kasyapa Ghrta*</i>	<b>3</b>	IP	7 days		

						vessels.
<b>Siroveshtana</b>	<i>Vasa Lakshadi Churna</i> and <i>Vasa Guducyadi Kvatha</i>	<b>1</b>	IP No. 1	12 days	A semisolid paste prepared by mixing 45g of all ingredients with the desired liquid medium was smeared over a Cora cloth and applied to the head (area with the paste facing inwards) in the following manner:  ❖ One end of the cloth was anchored above the right ear.  ❖ The cloth was wrapped over the forehead above the eyebrows and towards the left ear.  ❖ From the left ear, the cloth was wrapped around the back of the head and brought upwards around the head while the vertex is avoided.  ❖ The	❖ Penetration through the five layers of the scalp was facilitated.  ❖ Cell membranes absorbed the lipid-soluble extracts and facilitated entry into the systemic circulation.  ❖ Massage with oil before application of the paste generated heat and enhanced vasodilation, which allowed the lipids in the oil to absorb the essential elements of the paste.  ❖ The plantain leaf kept over the head in <i>Talapoticchi</i> maintained an optimum temperature throughout the procedure.
			IP No. 2	14 days		
			IP No. 3	6 days		
	<i>Sida cordifolia</i> Linn., <i>Puerariatuberosa</i> Willd., <i>Nardostachysjatamansi</i> D. C.	<b>2</b>	IP No. 1	8 days		
			IP No. 2	8 days		
			IP No. 3	6 days		
Powder of <i>Sida cordifolia</i> Linn., <i>Puerariatuberosa</i> (Willd.) D. C., and <i>Nardostachysjatamansi</i> D. C., in <i>Bala Triphaladi Kvatha</i>						
Powder of <i>Adathodavasica</i> Nees., <i>Terminaliachebula</i> Retz., <i>Terminaliabellerica</i> Linn., <i>Emblicaofficinalis</i> Gaertn., and <i>Lacciferlacca</i> Kerr., and <i>Vasa Guducyadi Kvatha</i>	<b>3</b>	IP	7 days			

					<p>other end of the cloth was applied to the top of the head.</p> <p>❖ Any leftover paste was applied to the uncovered portion of the head.</p>
<b>Talapotic chil</b>	<i>Terminaliachebula</i> Retz., <i>Lacciferlacca</i> Kerr., <i>Symplocos racemosus</i> Roxb., <i>Glycyrrhiza glabra</i> Linn, <i>Vasaguducyadi Kvatha</i>	<b>2</b>	IP No. 1	5 days	<p>❖ A paste prepared from 30g of herbal powder and 60mL of herbal decoction was applied over a steamed plantain leaf.</p>
	<i>Vasa Lakshadi Churna</i> and <i>Vasa Kvatha</i>	<b>3</b>	IP	5 days	<p>❖ This leaf is then placed with the paste inwards over the patient's head and tied down using a Cora cloth.</p>
<b>SiroPicu</b>	<i>Sasanka Taila*</i> and <i>Lakshadi Kera</i>	<b>1</b>	IP No. 2	1 day	<p>❖ The oil was instilled on to a square-shaped piece of cotton gauze and placed over the bregma.</p>
<b>Sirolepa</b>	<i>Vasa Lakshadi Churna</i> and <i>Vasa Guducyadi Kvatha</i>	<b>2</b>	IP No. 1	14 days	<p>❖ A paste prepared using 30g of herbal powder and 60mL of decoction was kept over the vertex of the head.</p>
<b>Thala</b>	<i>Karutta Gutika</i> ,	<b>2</b>	IP No. 1	1 day	<p>❖ A</p>

	<i>Kzcchuradi Churna, NimbamrtadiEr and a Taila</i>		IP No. 3	6 days	paste prepared using 30g of herbal powder and 60mL of decoction was kept on a cotton gauze, which was placed over the bregma	
<b>Sirodhara</b>	<i>Sasanka Taila*</i> and <i>Lakshadi Kera</i>	<b>1</b>	IP No. 2	5 days	❖ The patient lay supine on the treatment table. A thin cloth band was tied around the forehead. A pot with an 8mm hole in the center of the bottom was suspended above the patient's head with ropes and a cotton wick was placed in the hole. The lukewarm decoction/oil was poured into the pot and was allowed to drain through the hole onto the patient's head. The pot was moved from side to side.	❖ Factors such as streaming, pressure, and temperature of the medicine enabled vasodilation, which allowed penetration through the follicular pores to the follicles.  ❖ Stimulation of the somato-autonomic nervous system occurred through sensors in the skin and hair follicles via the trigeminal nerve.  ❖ Decreased stimulation of the sympathetic nervous system occurred by reduction of metabolic processes.
	<i>Varanadi Kera</i> and <i>Sasanka Taila</i>		IP No. 3	7 days		
	<i>TriphalaGuducyadiKvatha</i>	<b>2</b>	IP No. 1	5 days		
	Decoction of <i>Cyperusrotundus</i> Linn . And <i>Emblicaofficinalis</i> Gaertn.	<b>2</b>	IP No. 1	7 days		
	Decoction of <i>Adathodavastica</i> Nees.	<b>2</b>	IP No. 1	7 days		
	Decoction of <i>Cyperusrotundus</i> Linn ., <i>Emblicaofficinalis</i> Gaertn., <i>Terminaliachebula</i> Retz., <i>Terminaliabellerica</i> Linn., and <i>Emblicaofficinalis</i> Gaertn.		IP No. 2	10 days		
	<i>Vasa Guducyadi Kvatha</i> and buttermilk		IP No. 3	10 days		
	<i>Lakshadi Kera</i> and <i>Sasanka Taila*</i>	<b>3</b>	IP	6 days		

<b>Lepa</b>	<i>Veroniacinerea</i> Linn., <i>Aloe vera</i> Tourm.	<b>1</b>	IP No. 1	12 days	❖ A paste prepared using 30g of herbal powder and 60mL of decoction was applied over the forehead in a uniform consistency.	❖ The skin's luster was enhanced by improving metabolism.  ❖ The cell membranes in the skin facilitated absorption of the lipid constituents.  ❖ The medicines, which had pharmacological properties, were absorbed into the system.
	<i>Cynodondactylon</i> D. Don, <i>Veroniacinerea</i> Linn.	<b>2</b>	IP No. 1	8 days		
* Patented medicine of Sreedhareeyam Ayurvedic Eye Hospital and Research Center; ^Patented medicine of Vasu Healthcare Pharmaceuticals; °Patented medicine of J & J Dechane Laboratories						



<b>Table No. 4: Timeline: Case No. 1</b>	
2015 - 2016	Patient develops distortion of central vision, inability for near work, and occasional floaters OD
	Consults an ophthalmologist, who diagnoses her with exudative ARMD.
	Declines to undergo conventional management
02/06/2016	Admission to Sreedhareeyam Ayurvedic Eye Hospital for a course of inpatient <i>Ayurvedic</i> management.
	<b>DVA (unaided):</b> LogMAR 1.1 OD, LogMAR 0.477 OS
	<b>DVA (aided):</b> LogMAR 0.602 OD, LogMAR 0.477 OS
	<b>NVA:</b> N36 OU  <b>Anterior Segment:</b> Normal findings OU

	<p><b>Pupillary examination:</b> Within normal limits OU</p> <p><b>Posterior Segment:</b> Dull foveal reflex, choroidal neovascularization, vitreous hemorrhage OD</p> <p><b>OCT:</b> choroidal neovascularization, cystoid macular edema OD</p>
	<p><i>Amrtottaram Kvatha</i> is started.</p> <p><i>Seka, Ascyotana</i> and <i>Bandhana</i> is started.</p>
03/06/2016	<p><i>Talapoticchil</i> and <i>Pratimarsa Nasya</i> are started.</p> <p><i>Anjana</i> is started.</p>
07/06/2016	<p><i>Talapoticchil</i> is stopped.</p>
08/06/2016	<p><i>Sirodhara</i> is started.</p> <p><i>Tarpana</i> and <i>Ascyotana</i> with <i>Sneha</i> is started.</p>
09/06/2016	<p><i>Amrtottaram Kvatha</i> is stopped.</p>
10/06/2016	<p><i>Sudarsanam Tab, Samirapancakam Kvatha,</i> and <i>Varanadi Kvatha</i> are started.</p> <p><i>Pratinarsa Nasya</i> is stopped.</p>
11/06/2016	<p><i>Seka</i> is stopped.</p>
12/06/2016	<p><i>Ascyotana, Anjana,</i> and <i>Tarpana</i> are stopped.</p>
16/06/2016	<p>All oral medicines and treatments are stopped. Patient is discharged,</p> <p><b>DVA (unaided):</b> LogMAR 1.1 OD, LogMAR 0.477 OS</p> <p><b>DVA (aided):</b> LogMAR 0.602 OD, LogMAR 0 OS</p> <p><b>NVA:</b> N24 OD, N18 OS</p> <p><b>Pupillary examination:</b> Within normal limits OU</p> <p><b>Posterior Segment:</b> Absorption of vitreous hemorrhage OD</p> <p><b>OCT:</b> reduction in cystoid macular edema OD</p>



03/04/2017	Patient reports for a follow-up consultation
	<b>DVA (unaided):</b> LogMAR 1 OD, LogMAR 0.176 OS
	<b>DVA (aided):</b> LogMAR 0.602 OD, LogMAR 0 OS <b>NVA:</b> N18 OD, N6 OS
24/09/2017	Patient reports for a second round of inpatient management
	<b>DVA (unaided):</b> LogMAR 0.778 OD, LogMAR 0.477 OS
	<b>DVA: (aided):</b> LogMAR 0.176 OU <b>NVA:</b> N18 OU
	<i>Samirapancakam Kvatha</i> is started. <i>Siroveshtana, Netra Dhara, and Anjana</i> are started.
29/09/2017	<i>Ascyotana</i> and <i>Bandhana</i> are started.
02/10/2017	<i>Siroveshtana</i> is stopped.
	<i>Siro Picu</i> and <i>Sirodhara</i> are started.
05/10/2017	<i>Tarpana</i> is started
08/10/2017	All medicines and treatments are stopped.
	<b>DVA (unaided):</b> LogMAR 0.778 OD, LogMAR 0.477 OS
	<b>DVA: (aided):</b> LogMAR 0.176 OU <b>NVA:</b> N18 OU
	<b>Posterior Segment:</b> Further absorption of vitreous hemorrhage OD
	<b>OCT:</b> resolution of macular edema
06/05/2019	Patient reports for a third round of inpatient management
	<b>DVA (unaided):</b> LogMAR 1 OD, LogMAR 0.778 OS

	<p><b>DVA (aided):</b> LogMAR 0.477 OD, LogMAR 0.301 OS</p> <p><b>NVA:</b> N18 OU</p>
	<p><i>Samira Pancakam Kvatha*</i> and <i>Candraprabha Vati</i> are started</p> <p><i>Netra Dhara</i> and <i>Siroveshtana</i> are started.</p>
08/05/2019	<i>Sirodhara</i> is started
15/05/2019	<i>Tarpana</i> is started
21/05/2019	All medicines and treatments are stopped
	<p><b>DVA (unaided):</b> LogMAR 0.778 OD, LogMAR 477 OS</p> <p><b>DVA (aided):</b> LogMAR 0.477 OD, LogMAR 0.301 OS</p> <p><b>NVA:</b> N18 OU</p>

**Table No. 5: Timeline: Case No. 2**

2011 - 2018	<p>Patient develops distortion of central vision, inability for near work, and occasional floaters</p> <p>Consults an ophthalmologist, who diagnoses her with exudative ARMD.</p> <p>Undergoes 4 rounds of Avastin injection, two rounds of injection of Accentrix, and one round of pan-retinal LASER photocoagulation, which provides no relief</p>
22/09/2018	<p>Patient reports for the first round of inpatient management</p> <p><b>DVA (unaided):</b> LogMAR 0.602 OD, LogMAR 1.477 OS</p> <p><b>DVA (aided):</b> LogMAR 0.176 OD, LogMAR 1.477 OS</p> <p><b>NVA:</b> N18 OD, N24 OS</p> <p><b>Anterior Segment:</b> Within normal limits OU</p> <p><b>Pupillary Examination:</b> Within normal limits OU</p>

	<p><b>Posterior Segment:</b> within normal limits OD, old macular scar, choroidal neovascularization, and hemorrhages OS</p> <p><b>OCT:</b> macular edema OU</p>
	<p><i>Amrtottaram Kvatha, Punarnavadi Kvatha, and Saptamrta Lauha</i> are started</p> <p><i>Netra Dhara, Anjana, Bidalaka, and Thala</i> are started.</p>
24/09/2018	<p><i>Ascyotana</i> and <i>Talapoticchl</i> are started</p> <p><i>Thala</i> is stopped.</p>
29/09/2018	<p><i>Purampada</i> is stopped</p>
01/10/2018	<p><i>Talapoticchl</i> is stopped.</p> <p><i>Sirodhara</i> is started.</p>
02/10/2018	<p><i>Netra Picu</i> is started</p>
08/10/2018	<p><i>Sirodharais</i> stopped</p>
09/10/2018	<p>All treatments and medicines are stopped</p> <p><b>DVA (unaided):</b> LogMAR 0.602 OD, LogMAR 1.477 OS</p> <p><b>DVA (aided):</b> LogMAR 0.176 OD, LogMAR 1.477 OS</p> <p><b>NVA:</b> N18 OD, N24 OS</p>
22/08/2019	<p>Patient reports for her second round of treatment.</p> <p><b>DVA (unaided):</b> LogMAR 1 OD, LogMAR 1.477 OS</p> <p><b>DVA (aided):</b> LogMAR 0.301 OD, LogMAR 1.477 OS</p> <p><b>NVA:</b> N18 OU</p> <p><b>Posterior Segment:</b> Macular scar and reduction of hemorrhages and choroidal neovascularization OS</p> <p><b>OCT:</b> Reduction of macular edema OU</p>

	<p><i>Drakshadi Kvatha</i>, <i>Saptamrta Lauha</i>, and <b>Alert Capsule</b> are started.</p> <p><i>Netra Dhara</i>, <i>Pindi</i>, <i>Anjana</i>, and <i>Siroveshtana</i> are started.</p>
30/08/2019	<p><i>Siroveshtana</i> and <i>Pindi</i> are stopped.</p> <p><i>Sirodhara</i> and <i>Netra Picu</i> are started.</p>
09/09/2019	<p>All medicines and treatments are stopped.</p> <p><b>DVA (unaided):</b> LogMAR 0.778 OD, LogMAR 1.301 OS</p> <p><b>DVA (aided):</b> LogMAR 0.176 OD, LogMAR 1.301 OS</p> <p><b>NVA:</b> N18 OU</p> <p><b>Posterior Segment:</b> Macular scar, reduction of choroidal neovascularization, and resolution of hemorrhages OS</p> <p><b>OCT:</b> More reduction of macular edema OU</p>
09/10/2019	<p>Patient reports for a follow-up consultation</p> <p><b>DVA (unaided):</b> LogMAR 0.778 OD, LogMAR 1.301 OS</p> <p><b>DVA (aided):</b> LogMAR 0.176 OD, LogMAR 1.301 OS</p> <p><b>NVA:</b> N18 OU</p>
03/02/2020	<p>Patient reports for her third round of inpatient management.</p> <p><b>DVA (unaided):</b> LogMAR 0.778 OD, LogMAR 1.301 OS</p> <p><b>DVA (aided):</b> LogMAR 0.176 OD, LogMAR 1.301 OS</p> <p><b>NVA:</b> N18 OU</p> <p><i>Drakshadi Kvatha</i> and <i>Saptamrta Lauha</i> are started.</p> <p><i>Netra Dhara</i>, <i>Bidalaka</i>, <i>Siroveshtana</i>, and <i>Thala</i> are started.</p>
09/02/2020	<p><i>Siroveshtana</i> and <i>Thala</i> are stopped.</p>

	<i>Takradhara</i> is started.
12/02/2020	<i>Ascyotana</i> and <i>Bandhana</i> are started.
19/02/2020	All medicines and treatments are stopped.
	<b>DVA (unaided):</b> LogMAR 0.778 OD, LogMAR 1.301 OS
	<b>DVA (aided):</b> LogMAR 0.176 OD, LogMAR 1.301 OS
	<b>NVA:</b> N18 OU
	<b>Posterior segment:</b> Macular scar, resolution of choroidal neovascularization OS
	<b>OCT:</b> Reduction in macular edema OU

<b>Table No. 6: Timeline: Case No. 3</b>	
2011 - 2015	Patient develops distortion of central vision, inability for near work, and occasional floaters OD
	Consults an ophthalmologist, who diagnoses her with exudative ARMD.
	Undergoes one round of Avastin injection, which provides relief
2015	Symptoms reappear
2015-2019	Undergoes four more rounds of Avastin injection, but does not provide relief.
28/07/2019	Approaches Sreedhareeyam's Outpatient Consultation Unit in Cochin
	<b>DVA (unaided):</b> LogMAR 1.079 OD, LogMAR 0.477 OS
	<b>DVA (aided):</b> LogMAR 0.602 OD, LogMAR 0 OS
	<b>NVA:</b> N36 OU
14/08/2019	Patient has her second round of OP consultation and is advised inpatient management.
19/08/2019	Patient reports for a course of inpatient management.

	<p><b>DVA (unaided):</b> LogMAR 0.778 OD, LogMAR 0.602 OS</p> <p><b>DVA (aided):</b> LogMAR 0.176 OU</p> <p><b>NVA:</b> N36 OD, N12 OS</p> <p><b>Anterior Segment:</b> Within normal limits OU</p> <p><b>Pupillary Examination:</b> Sluggish OD, within normal limits OS</p> <p><b>Posterior Segment:</b> Drusen, macular degeneration, attenuation of blood vessels OD, normal findings OS</p> <p><b>OCT:</b> macular edema</p>
	<p><i>Amrtottaram Kvatha, Candraprabha Vati, Chiniumco, and Vara Curna</i> are started</p> <p><i>Netra Dhara, Ascyotana, Pindi, and Siroveshtanam</i> are started.</p>
20/08/2019	<i>Lepa</i> is started.
30/08/2019	<i>Siroveshtana</i> and <i>Lepa</i> are stopped. <i>Talapoticchil</i> is started.
01/09/2019	<i>Ascyotana</i> and <i>Bandhana</i> are started.
08/09/2019	All medicines and treatments are stopped
<p><b>DVA (unaided):</b> LogMAR 0.778 OD, LogMAR 0.602 OS</p> <p><b>DVA (aided):</b> LogMAR 0.176 OU</p>	<p><b>DVA (unaided):</b> LogMAR 0.778 OD, LogMAR 0.602 OS</p> <p><b>DVA (aided):</b> LogMAR 0.176 OU</p> <p><b>NVA:</b> N36 OD, N12 OS</p> <p><b>Posterior Segment:</b> Reduction of drusen OD</p> <p><b>OCT:</b> macular edema OD</p>



NVA: N36 OD, N12 OS	
09/10/2019	Patient reports for a follow-up consultation  <b>DVA (unaided):</b> LogMAR 1 OD, LogMAR 0.176 OS  <b>DVA (aided):</b> LogMAR 0.602 OD, LogMAR 0 OS  <b>NVA:</b> N36 OD, N12 OS
13/11/2019	Patient reports for a follow-up consultation
11/12/2019	Patient reports for a follow-up consultation
14/01/2020	Patient reports for a follow-up consultation  <b>DVA (unaided):</b> LogMAR 1 OD, LogMAR 0.176 OS  <b>DVA (aided):</b> LogMAR 0.602 OD, LogMAR 0 OS  <b>NVA:</b> N36 OD, N12 OS
11/03/2020	Patient reports for a follow-up conversation  <b>DVA (unaided):</b> LogMAR 1 OD, LogMAR 0.176 OS  <b>DVA (aided):</b> LogMAR 0.602 OD, LogMAR 0 OS  <b>NVA:</b> N36 OD, N12 OS

## DISCUSSION

Causative factors for exudative ARMD according to *Ayurveda* are the pathological increase of *Vata* (somatic humor responsible for motion) and *Pitta* (somatic humor responsible for metabolism). The Increased *Vata* caused compromised nutrition and excretion, leading to deposition of *Ama* (undigested toxic metabolites) at the macula, which in turn caused *Srotorodha* (obstruction of the *Srotas*), leading to compromised nutrition. This results in impaired function of *Alocaka Pitta*, which is responsible for vision. The impaired nutrition,

subsequent obstruction of *Srotas*, and the increase of deranged *Pitta* results in hypoxia to the macula, leading to choroidal neovascularization.

Neovascularization was due to *Vimarga Gamana* (diversion of flow to improper channels) of the *Raktavaha Srotas*(metabolic channels carrying blood), which was caused by increased *Pitta* due to the *Asraya-Asrayi Bhava* (homologous relationship) between *Pitta* and *Rakta*. Vitreous hemorrhage was due to further increase of *Vata*, resulting in vessel rupture. The hemorrhage was also correlated with *Urdhvaga Raktapitta* (hemorrhage in the upper extremity).

ARMD is the result of injury due to photo-oxidative stress and resultant inflammation. Free radicals, which are generated in the macula by its constant exposure to light, result in retinal cell damage by damage to DNA and the cell membranes. Over time, the nerve cells at the macula are injured, ultimately resulting in its degeneration.<sup>5</sup> One mechanism for this is lipid peroxidation of polyunsaturated fatty acids, leading to disruption and reduced fluidity of membranes.<sup>6</sup> The trigger factor of neovascularization and choroidal neovascularization membrane or CNVM (hypoxia or inflammation, or both) remains unanswered. The process of choroidal neovascularization (CNV) is a complex interplay between stimulants and inhibitors. Hypoxia or ischemia may play a role in neovascularization also.

The pharmacology and effects of oral medicines are explained in **Table 2**, and the probable mode of action of the external therapies is explained in **Table 3**. Most of the ingredients of the medicines are antioxidant by nature, which helped to scavenge and neutralize free radicals and limit the damage to the macula. Administration of medicines having antioxidant property conforms to the fact that antioxidants themselves are not produced in the body, and therefore must be supplemented in the form of medicine or diet. Also, a combination of antioxidants provides a degree of protection that is not achieved by a single antioxidant alone.<sup>5</sup>

*Seka*,<sup>7</sup>*Ascyotana*,<sup>8</sup>*Pindi*,<sup>9</sup> *Bidalaka*,<sup>10</sup> and *Tarpana*<sup>11</sup> were done as per the references in the *Samhitas* or ancient works of *Ayurveda*. *Talapoticchil*, *Sirolepa*, and *Lepaare* traditional treatments practiced in Kerala State, India. *Netra Dhara* is a variation of *Seka* practiced in Sreedhareeyam Hospital in which irrigation is done while the patient slowly blinks. *Anjana* or application of collyrium, generally done by applying a rod in the bulbar conjunctiva from the inner canthus to the outer canthus and back,<sup>12</sup> is done in the manner of *Ascyotana* due to hygienic restrictions. *Siroveshtanam* is a treatment in which a paste is kept on a Cora cloth

and tied around the head while anchoring one end over the left ear and tying the other end over the top of the cranium.

A diabetic diet regimen was recommended for the patients, although they did not have diabetes. Its aim was to reduce neovascularization, *Kapha Dosha*, and *Pitta Dosha* in the body. All major food groups except meat, fish, and poultry, were advised in the right quantity. Liberal amounts of vegetables and pulses were advised for consuming because of their high concentrations of fiber. Wrong concepts of food intake such as intermittent fasting, avoiding rice and adherence only to wheat, and products prepared from refined flour, oils, lipids, and sweets were advised to be strictly avoided.

## CONCLUSION

Maintaining vision was a challenge in these patients because of their advanced age and the severity of their condition. Although improvement of posterior segment findings was observed in the patients, visual acuity showed marginal improvement. Improvements observed can be attributed to treatment effects, patient compliance, and adherence to instructions both during and after hospital stay. A concerted effort by the four limbs of treatment described by *Ayurveda*, viz., physician, assistant, medicament, and patient, was key to these positive results. The results of this case series may be validated by large-scale sample trials and investigations, and by employing multiple parameters of diagnosis and management.

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