

## EXPLORING A KNOWLEDGE OF JARAJANYA TIMIRA IN AYURVEDA W.S.R TO AGE RELATED MACULAR DEGENERATION AND ITS MANAGEMENT

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### ABSTRACT

'JARA' the old age is an unavoidable phase of life. *Ayurveda* says process of senescence begins naturally under the influence of *kaala*. Sharangadhara has mentioned bio-loss of *dristi* occurs at the 6<sup>th</sup> decade of life and according to Vagbhata 7<sup>th</sup> decade of life. Age Related Macular Degeneration or ARMD is a degenerative disease associated with ageing that affects the macula and causes gradual loss of vision. It is the leading cause of the vision loss in population above the age of 65 years. It is caused by hardening of small arteries supplying oxygen and nutrients to the retina which deprives the macula of oxygen and nutrition results in progressive loss of vision. The condition is characterized by degeneration of light sensitive cells of the central region of the retina. The macula which mal-functions and eventually dies, resulting in gradual decline and loss of central vision while peripheral vision is retained. ARMD can be considered as *Prathama, Dwitiya and Trutiya Patalgataroga*. There is degeneration and loss of neural tissue, which indicates that there is involvement of *Vatadosha* as old age is associated with predominance of *Vata* and also neural tissue is considered as a component of *Vata* in the body. In later stages of disease, however the involvement of other *doshas* i.e. *rakta* and *pitta* along with *Vata* is also visible as neovascularisation and bleeding are caused by abnormality of *rakta* and inflammation is a feature of vitiated *pitta* and *Vata*. All dry types of ARMD are purely *vata* type and wet type has *pitta dosha* along with *vata*. Therapies which improve homeostasis and ocular strength should be practiced. Visual loss caused by ARMD cannot normally be reversed. The overall results of modern treatment in both types of ARMD are not very encouraging. Ayurvedic herbal medicines prevent a deterioration of the retina as well as the optic nerve and provide micronutrients to the macula which transmits the sensation of vision to the brain. This paper reviews the pathophysiology of ARMD with a view to understand the possible role of Ayurveda in the management of ARMD.

**Keywords:** *Jara*, age related macular degeneration (ARMD), *patalagataroga*, macula

### INTRODUCTION

'*Netra*' is *Pradhanaindriya* (vital sense organ) among all sense organs as we receive 80% knowledge through our eyes. Various changes occur in all the structures of eye as age progresses causing varied ef-

fects. Age Related Macular Degeneration (ARMD) is one such disease occurs as a result of aging. It is a degenerative condition of photoreceptors in macular area leading to painless gradual loss of central vision in the people aged above 50 years. There are two forms of ARMD i.e. dry ARMD and Wet ARMD. According to different studies (Beaver dam eye study, Blue mountain eye study, and Rotterdam eye study) prevalence of ARMD ranges from 1.2% to 29.3%. Approximately 23.5 million people suffering with ARMD worldwide<sup>1</sup>. According to WHO, ARMD is the 3<sup>rd</sup> leading cause of blindness among people aged above 50years and worldwide blindness prevalence of 9%<sup>2</sup>. Indian prevalence ranges from 1.8% to 4.7%<sup>3</sup>. Studies reported that in southern India 1.1% and in Northern India 4.7% people suffering from ARMD. In one of study of global prevalence of AMD including 39 studies worldwide showed the pooled prevalence of early, late, and age related macular degeneration (ARMD) to be 8.01%, 0.37%, and 8.69% respectively. It was found a higher prevalence of early ARMD in Europeans than in Asian. Whereas late ARMD more prevalent in Europeans than in Africans. There was no difference in prevalence between Asian and Africans. Globally the projected number of people with ARMD in 2020 is 196 million, increasing to 288 millions in 2040<sup>4</sup>. As the motto of *ayurveda* says that '*Swastasya Swastya Rakshanam*' prevention is always better than cure. So, our aim should be to prevent the disease in early stage so that we can preserve the vision in old age. Description of macular degeneration is not clearly described in our classics. Based on its features it can be correlated to *Prathama, Dwitiya, Tritiyapatalagata timira*. As disease occurs in old age which predominates *Vata Dosha* also degeneration and loss of neural tissue occurs here which is suggestive of *Vata* predominance in this condition it can be taken as *Vataja or Jarajanya Timira*.

As such there is no satisfactory treatment for ARMD in contemporary medicine. Dry ARMD predominant of *Vata* and wet ARMD predominant of *Vata* and *Pitta*. So, general treatment of geriatric eye disorders should be *Vatagna upakramas* like *Snehana, Mruduvirechana, Snehabasti, Shiribasti, Shiropichu, Snaihi-*

*kanasya, Snigdhaanjana* etc has to be followed. *Rasayanas, Chakshushya* and *Drustiprasadaka Shamanoushadis* should be used. So, in this study effort has been made to understand etiology, pathophysiology, signs and symptoms of ARMD in ayurvedic perspective and better preventive and curative aspect has been studied here.

## MATERIALS AND METHODS

1. Source of study: Samhitas, books and internet sources
2. Detailed study of cause, pathology, signs and symptoms etc of Age Related Macular Degeneration was done, study of similar features in samhitas and its correlational study has been done.
3. Treatment under the headings of preventive and curative aspect, yoga and *Rasayana* (rejuvenating) therapy has been studied.

**RISK FACTORS:** There are two types of risk factors  
A. Established risk factors B. Possible risk factors

### A. Established:

1. **Age:** it is greatest risk factor as degeneration occurs in various structures as age advances. It may occur in middle age only in 2% people and 30% in people above the 60 years of age, they are at higher risk of getting ARMD.
2. **Family history:** The interaction between genes or genes and environment plays a predominant role in the development of ARMD
3. **Malnutrition:** nutrition is required for the maintenance of macular pigments so malnutrition causes its degeneration.
4. **Food:** fatty foods, processed food, packaged food, low in fresh vegetable oil and food rich in omega-6 fatty acids all these promote inflammation.
5. **Exposure to sunlight:** Blue wavelength from sun damages the macula
6. **Hyperopic:** Hyperopic eyes had a 13% higher risk of early AMD. In contrast, myopic eyes had a 25% lower risk of early AMD. Studies have found that shorter hyperopic eyes are likely to have increased Scleral rigidity, which results in increased choroidal vascular resistance and consequently

reduces the transfer of oxygen and nutrients to the outer retina and finally impairs retinal pigment epithelium function<sup>5</sup>.

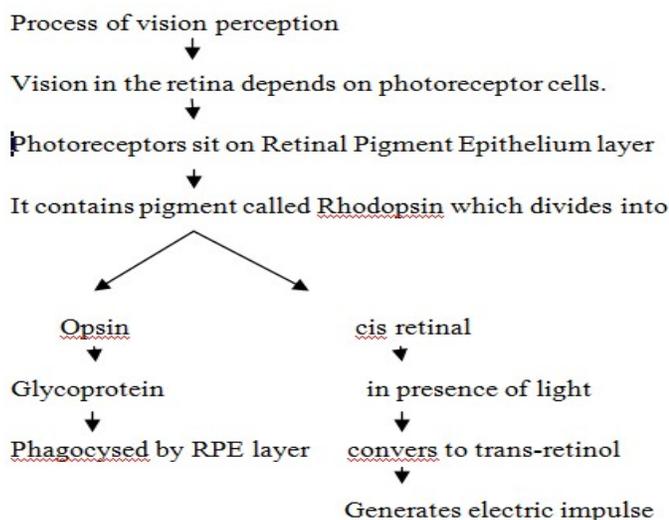
7. **Smoking:** Smokers are up to four times more likely than non-smokers to have macular degeneration, public health experts at the University of Manchester said in a British Medical Journal report. Smoking causes oxidative stress leading to damaging of retina.
8. **Race:** whites are more prone because of less melanin in skin leads to more absorption of sunlight.

### B. Possible risk factors:

1. **Gender:** Females are more prone to develop ARMD because of their longer life duration than males there is more time to development of disease
2. **Cardiovascular disease:** It causes vascular damage and constriction of vessels restricting oxygen flow to retina leading to retinal degeneration.
3. **Light coloured iris/blue eyes:** it offers less protection from damaging UV light and blue light.

### PATHOPHYSIOLOGY<sup>6</sup>:

Figure 1: Physiology of light perception



- This whole process requires oxygen and nutrition supplied by Choriocapillaries.

Age related macular degeneration is caused by sclerosis of the arteries that nourish the retina. This deprives the sensitive retinal tissue of the oxygen and nutrients that it needs to function and thrive. The atrophic form possibly results from the thinning of the macular tissues, amorphous deposits and pigmentation in the macula. Exudative macular degeneration occurs when new vessels form a choroidal new vascular membrane to improve the blood supply to oxygen deprived retinal tissue. These new vessels are friable and leak blood and fluid causing damage to surrounding tissue<sup>6</sup>.

### VISUAL SYMPTOMS:

1. NON NEOVASCULAR OR ATROPHIC-Early stage, less severe, 85% to 90% of cases  
There are 3 stages: Early, Intermediate, Late  
**Early Stage:** Several small drusen or a few medium sized drusen are detected on the macula in one or both eyes. (There are irregular pale dots at the macula, which are called drusen. They are caused by a build-up of waste products from photoreceptor metabolism) generally, there is no vision loss in the early stage.  
**Intermediate Stage:** Many medium sized drusen or one or more large drusen are detected in one or both eyes. At this stage, your central vision may start to

blur and you may need extra light for reading or doing detail work.

**Late Stage:** Several large drusen, as well as extensive breakdown of light-sensitive cells in the macula, are detected. This causes a well-defined spot of blurring in your central vision. The blurred area may become larger and more opaque over time.

**Signs and symptoms:** Blurring of vision

**On examination:** Drusens can be seen under direct ophthalmoscopy, RPE changes – atrophy, hyperplasia.

**DIAGNOSIS:** ARMD is diagnosed by **fundoscopic examination**. Visual changes can often be detected with an **Amsler Grid**. **Fluorescein angiography** is obtained when findings suggest wet ARMD and it demonstrates and characterizes subretinal or Choroidal neovascular membranes and can delineate areas of geographic atrophy. **Optical Coherence Tomography (OCT)** aids in identifying Intraretinal and Subretinal fluid and can help assess response to treatment.

**TREATMENT:** There is no satisfactory treatment for this disease in modern medicine; however following treatment is done as per stages

**Early ARMD-**Various **Antioxidants** are prescribed.

**Advanced neovascular ARMD: 1.Anti-VEGF injection therapy-**VEGF is a protein that promotes the growth of new abnormal blood vessels. Anti-VEGF injection therapy blocks this growth.

**2. Photodynamic therapy-** This technique involves laser treatment of select areas of the retina. The drug closes off the new blood vessels, slows their growth, and slows the rate of vision loss

**3. Laser surgery-** It involves aiming an intense “hot” laser at the abnormal blood vessels in your eyes to destroy them.

**AYURVEDIC PERSPECTIVE OF ARMD:** Description of macular degeneration is not clearly described in our classics

1. A.R.M.D. Can be considered as 1,2,3<sup>th</sup> *Patalagataroga* based on its *lakshanas*
2. As the disease occurs in old age and there is degeneration and loss of neural tissue it suggestive of predominance of *Vatadosha* in both conditions.
3. Dry ARMD is purely *Vata* predominant
4. Wet ARMD predominates *Vata* along with *Pitta*, which is visible as neovascularisation and bleeding caused due to abnormality of *Pitta*.

**NIDANA:** *Samanyanetraroga nidana*<sup>7</sup>

**SAMPRAPTI:** *Nidanasevana lead to Vata, Pitta vitiation especially Alochaka pitta vitiation- Rakta, Meda, Majjadhatudushti-enters internal Patalas (drushtimandal) & affects visual acuity; Dosha- Vata vitiation in dry AMD; Pitta, Rakta, kapha vitiation in wet AMD; Dhātu – Rakta, Meda, Majja; Site - Drushtigata 1st, 2nd, 3rd Patalgata dosha vitiation*

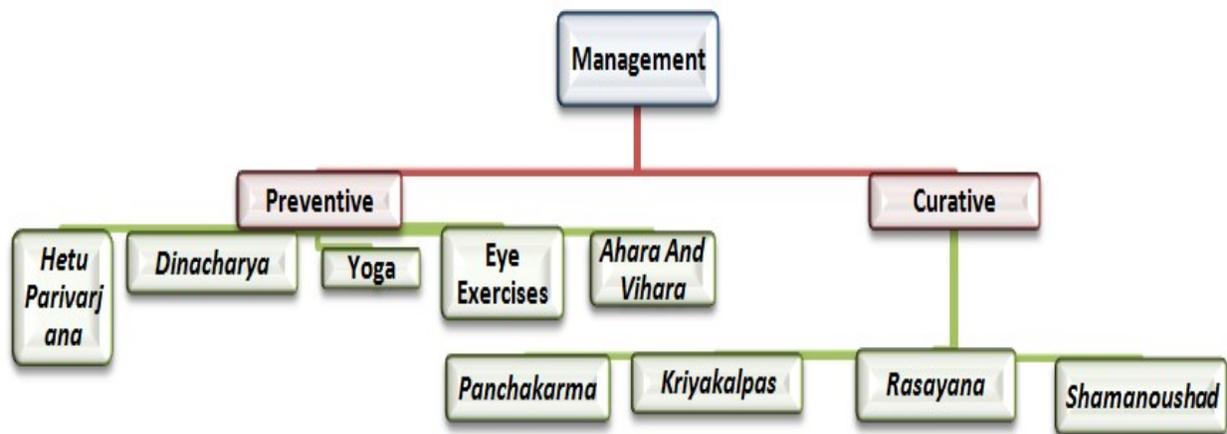
**LAKSHANS (Clinical features):** Blurring of vision: *Avyaktanisarupani (1<sup>st</sup> patala)*, Difficulty in near work: *Suchipashamnapashyati (2<sup>nd</sup> patala)*; Distorted vision: *Metamorphopsia, Micropsia, Macropsia (Drushtigocharvibhramat) 2<sup>nd</sup> patala*; Altered brightness: *Rupaniaaachhaditanieva vasasa (3<sup>rd</sup> patala)*; Central scotoma: *Karnanasakshiyuktani viparitani veekshyate (3<sup>rd</sup> patala)*,

**COMPLICATION:** Complete loss of vision (*Upadrava: linganasha*)

**MANAGEMENT:**

Treatment should be *Rakta, Pitta shamaka, Raktaprasadana* and *Vataniyamana.*, *Yogas* described in *Vatajatimira* should be used in dry A.M.D., *Yogas* described in *pittajatimira* should be used in wet A.M.D, As *Dosha* enters inner *Patala*, becomes difficult to treat. Hence treatment should be started at early stage.

Figure no.2 Management of *Jarajanya timira*



## DISCUSSION

As Geriatric eye disorders occur due to degenerative changes in retina (*Drushtigata dosha dushti*). Senile disorders are difficult to treat due to its “*Swabhava-bala*”. As per principle of Ayurveda, “*Swasthasya swashthya rakshanam*” prevention is always better. Preventive measures like *Hetupariverjan*, *Dincharya*, *Rasayanachikitsa*, Eye exercises and yogic (rejuvena-

tion therapy) will be more effective to prolong degenerative changes in eyeball. We can avoid bad effects on eyes, due to changed life style by following “*NetraRakshaVidhi*”. Preventive and curative aspect planned here after proper study and analysis of *Samprapti*, *Dosha*, *Dushya*, *Lakshana* of disease and probable action of it has been explained.

**Table 2:** Discussion on mode of action

Sl.no	Treatment	Mode of action
1.	<i>Virechana</i>	<i>Srotoshodhaka, pittahara, pratilomachikitsa</i> - Arrest pathogenesis of disease (reduces further worsening of disease)
2.	<i>Sneha Basti</i>	<i>Vatahara</i> , Richabsortion in gut, fast action
3.	<i>Shirodhara</i>	Accelerates The Function Of <i>TarpakaKapha, Shothahara</i> Increases circulation, reduces oedema, promote reabsorption of blood
4.	<i>Nasya</i>	<i>Raktapittahara, urdhwadoshahara</i> - Haemostatic, helps to maintain the normal structural and function integrity by stimulation of endocrine function, Increases circulation, improves local immunity
5.	<i>KriyaKalpa</i>	Promotes blood supply, nourishes eye structures, endothelial repair, prevents loss of pericytes

## CONCLUSION

Geriatric eye disorders and A.M.D. are going to be a big challenge for us in the near future. Increased life span with unhealthy lifestyle is definitely leading to long term damage to eye. There is no satisfactory treatment in modern medicine. As A.R.M.D. and other geriatric eye conditions are multi factorial holistic approach, combined therapy with preventive measures, *Chakshushya*, *Rasayanas*, eye exercises & yoga will

be more beneficial than a single drug therapy. Proper intervention of *Shodhana* (purificatory therapy), *Kriyakalpas* (eye treatments), life style modification, *Pathyaapathya* (diet) and proper follow-up with oral medicine helps to retard the progression.

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