



Review Article

AN AYURVEDIC PERSPECTIVE TO GERIATRIC EYE DISORDERS WITH SPECIAL REFERENCE TO AGE RELATED MACULAR DEGENERATION (A.M.D.)

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ABSTRACT

Recent advancements have remarkably increased average lifespan in human beings. It is obvious and inevitable that various changes occur in ocular tissue as age progresses. However, changed lifestyle has resulted in early ageing. Geriatric eye disorders are going to be a big challenge in the next years. Cataract, Glaucoma, dry eye syndrome, age related macular degeneration are the main disorders occurring in old age and can grossly affect visual acuity.

Age related macular degeneration (A.M.D.) is a painless degenerative condition of photoreceptor cells in the macular area of the retina; having two types dry and wet AMD. A.M.D. is one of the leading causes of irreversible blindness above age of 50. There are nearly 23.5 million people suffering from this disease in the world.

There is no satisfactory treatment for this disease in modern medicine. Therefore, attempt has been made to find out better solution through *Ayurveda*. Our aim should be to prevent and treat the diseases in early stage so that we can preserve our eyesight even in the old age. Hence *Rasayana chikitsa* (rejuvenation) will be helpful in prolonging degenerative changes. In this conceptual study, various changes occurring in eye due to ageing are studied. In A.M.D., symptoms are similar to *Timira (Patalgata dosha dushti)*. So according to *Dosha, Dushya* vitiation; basic line of treatment is suggested. As A.M.D. and other geriatric eye conditions are multi factorial, holistic approach with combined therapy with *Chakshushya Rasayanas*, eye exercises & *yoga* will be more beneficial than a single drug therapy.

KEYWORDS: Geriatric eye diseases, Age related macular degeneration, Ayurveda, *Chakshushya rasayana*, *Yoga*, Eye exercises.

INTRODUCTION

Recent advancements in the modern medicine have remarkably increased average lifespan in human beings. However, changed lifestyle, unhealthy dietary habits, pollution have resulted in early ageing. Long lifespan is desirable only if physical & psychological health is good. Old age can be a curse for unhealthy individuals. We receive about 80 % of knowledge with the help of our eyes. So every human being must protect his eye & eyesight throughout his life.¹ It is obvious and inevitable that various changes occur in ocular tissue as age progresses. Our aim should be to prevent and treat the diseases in early stage and to prolong ageing process so that we can preserve our vision even in the old age.

Age related macular degeneration (A.M.D.) is a painless degenerative condition of photoreceptor cells in the macular area of the retina. Macula is light sensitive layer in the central part of the retina and is responsible for visual acuity and color vision. There are two types of AMD; dry AMD and wet AMD. Early symptoms of dry AMD include slightly blurred vision, the need for more light for reading, and difficulty recognizing faces until very close to the person. A symptom of more advanced dry AMD is the presence of a blurred spot in the center of vision. An early symptom of wet AMD is the wavy appearance of straight lines. A.M.D. is the leading cause of irreversible blindness above age of 50². There are nearly 23.5 million people suffering from this disease in the world.³ It affects about

8.7% of the world's population and is the leading cause of blindness among people aged 50 and older in industrialized countries. According to WHO; A.M.D. is third cause of visual impairment, having prevalence of 8.7%. By 2040, it is estimated that the percentage of A.M.D affected individuals may increase two-fold or more.⁴ There is no satisfactory treatment for this disease in modern medicine.^{2,3} Therefore, in this conceptual study; attempt has been made to find out better solution through *Ayurveda*.

MATERIALS AND METHODS

Study of literature – books, *Samhita*, internet website was done.

Study of Age related macular degeneration (A.M.D.) and *Patalgat doshdushti* was done.

Treatment modalities under following headings *Hetuparivarjan* (preventive measures), eye exercises, *Yogic kriya*, *Kriyakalpa*, *Panchakarma* and medicinal treatment are suggested.

Anatomical, Physiological & Pathological changes occurring in the eyes due to Ageing:⁵

- Eyelids - loss of periorbital fat (*Meda dhatu kshaya*), Laxity of skin & orbicularis oculi muscle (*Mansa kshaya*)→ Entropion, Ectropion, Trichiasis (*Pakshmayavartan, Pakshmakopa*)

- Lacrymal apparatus - Reduced tears secretions → Dry Eye (*Rasadhatu & snigdha guna kshaya*) - Skin, muscle laxity → Improper pumping action of tears in to the punctum → epiphora
- Conjunctiva - Dry lustreless dull conjunctiva → xerosis, Degenerative conditions of conjunctiva like pinguicula, pterygium (*Rasa, Sneha kshaya, Shosha*).
- Sclera-fatty hyaline calcareous degeneration, scleromalacia perforans, especially in a elderly women associated with polyarticular rheumatism.
- Cornea - Arcus Senilis → lipoid degeneration of cornea. Exposure keratitis (*Vata vitiation*).
- Lens - Opacity → Senile cataract
- Trabecular meshwork - Sclerosis → obstruction in aqueous outflow → increased intra ocular pressure (Glaucoma).
- Vitreous - Senile degeneration → vitreous opacities → floaters.
- Refractive errors - loss of elasticity of lens capsule, decreased tone of ciliary muscles → presbyopia, hypermetropia.
- Retina -Age related macular degeneration, various retinopathies due to associated systemic diseases in old age e.g. hypertensive, diabetic retinopathy.

Cataract, Refractive errors, presbyopia, Glaucoma, dry eye syndrome, age related macular degeneration are the main disorders occurring in old age and can grossly affect visual acuity.

Basic Principles of treatment in Geriatric eye disorders

In Avurveda, lifespan is divided in three stages viz. *Balya, Youvana* and *Vardhakya* where *Kapha, Pitta* and *Vata dosha* are predominant respectively. In *Vardhakya* stage, *Vata dosha* is predominant. There is remarkable decrease of *Dhatu, Indriyabala* and *oja*.⁶

In all above mentioned changes, we can observe:

Dosha- *Vata vrudhhi, Kapha khsaya, Pitta dushti*

Guna -*Ruksha guna vrudhhi, Snigdha sthira guna khsaya.*

Dhatu - *Sarva dhatu kshaya, Oja kshaya.*

Indriya - *Bala hani.*

So general treatment for geriatric eye disorders should be *Vataghna Upakramas* like *Snehana, Snehapana, Ghrutapana, Mrudu virechana, Basti,*⁷ *Shiro basti, Shiro pichu, Nasya (snehana), Snigdha anjana, Parisheka with Siddha dugdha. Shamana chikitsa* should be *Rasayana* and *Chakshushya medicines.*

Study of Age Related Macular Degeneration (A.M.D.)

Prevalence of A.M.D.

A recent study of the global prevalence of A.M.D., shows that the number of people with AMD in 2020 is projected to be 196 million, which will increase to 288 million in 2040. Studies of AMD in low and middle income countries have shown that, in contrast to what was originally thought, AMD is not rare in Asian and African populations but is instead a significant contributor to blindness.

These estimates indicate the substantial global burden of age-related macular degeneration.⁸

According to the World Health Organization (WHO), AMD is the third cause of visual impairment and is associated with a worldwide blindness prevalence of almost 9%.⁴ It is estimated that approximately 7 million people in the US have intermediate AMD and 1.75 million have late AMD. Several studies have shown that late AMD is significantly more prevalent in Europeans than in African, Hispanic, or Asian populations.⁹

Data on AMD in India show prevalence ranging from 1.8% to 4.7%. Age-related macular degeneration is therefore a significant cause of visual morbidity.¹⁰

Age-related macular degeneration (AMD)-It is a disease of the retina that usually develops in people aged 50 years and older. AMD affects the macula. When it becomes advanced, it destroys the central vision. It is multi factorial disease and the condition is usually bilateral.¹¹

Risk Factors⁸-

Age- The greatest risk factor is age. Although AMD may occur during middle age, studies show that people over age 60 are clearly at greater risk than other age groups. For instance, a large study found that people in middle-age have about a 2 percent risk of getting AMD, but this risk increased to nearly 30 percent in those over age 75.

Smoking- Smoking may increase the risk of AMD. 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. In Great Britain, an estimated 53,900 people older than 69 have AMD attributed to smoking. Of that number, 17,900 are legally blind.

Another study from the Massachusetts Eye and Ear Infirmary showed that current and past smokers had a 1.9 and 1.7 fold greater risk, respectively, of AMD compared with non-smokers.

Obesity-Research studies suggest a link between obesity and the progression of early and intermediate stage AMD to advanced AMD.

Race- Whites are much more likely to lose vision from AMD than African and Americans.

Family history-Those with immediate family members who have AMD are at a higher risk of developing the disease.

Gender- Women appear to be at greater risk than men.

AMD is associated with other risk factors like high blood pressure, diabetes, cardiovascular disease, low physical activity, exposure to sunlight & High energy visible (H.E.V.) light, alcohol intake, elevated total cholesterol levels and poor diet.¹²

Types of AMD

1). Non exudative (dry AMD)⁸ Common type found in 90% of individuals.

In Dry macular degeneration, symptoms usually develop gradually. You may notice these vision changes:

- The need for increasingly bright light when reading or doing close work.
- Increasing difficulty adapting to low light levels, such as when entering a dimly lit restaurant.

- Increasing blurriness of printed words.
- A decrease in the intensity or brightness of colors.
- Difficulty in recognizing faces.
- A gradual increase in the haziness of your overall vision.
- A blurred or blind spot in the center of your field of vision.
- Hallucinations of geometric shapes or people, in cases of advanced macular degeneration.

Dry macular degeneration may affect one eye or both eyes. If only one eye is affected, you may not notice any or much change in your vision because your good eye compensates for the weak one. Dry macular degeneration is categorized in three stages based on the progression of damage in your eye:

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's 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.

Advanced 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.

2). Exudative (wet AMD)-Found in 10% individuals

Vision loss associated with drusen (colloid bodies), Atrophy of retinal pigment epithelium (RPE) or changes associated with subretinal neovascularization, RPE detachment, sub retinal exudates, bleeding, macular edema leading to rapid progressive loss of vision.

The damage may be rapid and severe, unlike the more gradual course of geographic atrophy. It is possible to have both geographic atrophy and neovascular AMD in the same eye, and either condition can appear first.

Diagnosis of A.M.D.⁸

Comprehensive dilated eye Fundus exam can detect AMD.

Visual acuity test- This eye chart measures distant visual acuity.

Amsler grid- Changes in your central vision may cause the lines in the grid to disappear or appear wavy, a sign of AMD.

Fluorescein angiogram- A fluorescent dye is injected. Pictures are taken as the dye passes through the blood vessels in the eye. This makes it possible to see leaking blood vessels, which occur in a severe, rapidly progressive type of AMD.

Optical coherence tomography (O.C.T) It uses light wave and can achieve very high-resolution images of any tissues that can be penetrated by light such as the eyes. Most people develop some very small drusen as a normal part of aging. The presence of medium-to-large drusen may

indicate AMD. Another sign of AMD is the appearance of pigmentary changes under the retina.

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

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

Researchers at the National Eye Institute tested whether taking nutritional supplements could protect against AMD in the Age-Related Eye Disease Studies (AREDS1 and AREDS2). They found that daily intake of certain high-dose vitamins and minerals can slow progression of the disease in people who have intermediate AMD, and those who have late AMD in one eye.

The first AREDS trial showed that a combination of vitamin C, vitamin E, beta-carotene, zinc, and copper can reduce the risk of late AMD by 25 percent. The AREDS2 trial tested whether this formulation could be improved by adding lutein, zeaxanthin or omega-3 fatty acids. Omega-3 fatty acids are nutrients enriched in fish oils. Lutein, zeaxanthin and beta-carotene all belong to the same family of vitamins and are abundant in green leafy vegetables.

The AREDS2 trial found that adding lutein and zeaxanthin or omega-three fatty acids to the original AREDS formulation (with beta-carotene) had no overall effect on the risk of late AMD. However, the trial also found that replacing beta-carotene with a 5-to-1 mixture of lutein and zeaxanthin may help further reduce the risk of late AMD. Moreover, while beta-carotene has been linked to an increased risk of lung cancer in current and former smokers, lutein and zeaxanthin appear to be safe regardless of smoking status.

While dietary supplements can't prevent AMD, they can help slow progression in people who have the disease.¹³

Advanced neovascular AMD⁸

Anti-VEGF injection therapy- With neovascular AMD, abnormally high levels of vascular endothelial growth factor (VEGF) are secreted in the eyes. VEGF is a protein that promotes the growth of new abnormal blood vessels. Anti-VEGF injection therapy blocks this growth.

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. This procedure is less common than anti-VEGF injections, and is often used in combination with them for specific types of neovascular AMD.

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

Ongoing research on A.M.D.

The National Eye Institute is conducting and supporting a number of studies to learn more about AMD. For example, scientists are:

- Studying the possibility of transplanting healthy cells into a diseased retina.
- Looking at certain anti-inflammatory treatments for the wet form of AMD.

AN AYURVEDIC PERSPECTIVE TO A.M.D.

Symptoms described in A.M.D. are similar to those of *Patalgat doshdushti* symptoms described in *Drushtigata* diseases. Some scholars compare it with *Pittavidagdha drushti*.

In dry A.M.D., *Vata dosha* vitiation whereas in wet A.M.D., *Pitta & Rakta dosha* vitiation is predominant.

Hetu¹⁴-Improper diet (consumption of spicy, fermented food, fast food) *Shukta, Aarnal* etc. consumption (alcohol consumption).

Improper Vihara- Atiyoga & Mithyayoga of *Netrendriya* (over exposure to high energy visible light emitted by computers, smart phones, televisions), *Sukshmanirikshanat* (watching at minute objects for prolonged time, (digital eye strain), *Dhoom* (smoking), *Kopa, Shoka, Klesha* (Psychological imbalance, strain), *Swapna viparyay* (Altered sleep pattern).

Pathogenesis - above causes lead to *Vata, Pitta* vitiation especially *Alochaka pitta* vitiation- *Rakta, Meda, Majja dhatu dushti*-enters internal *Patalas (drushtimandal)* & affects visual acuity.

Dosha- Vata vitiation in dry AMD

Pitta, Rakta, kapha vitiation in wet AMD.

Dhatu – Rakta, Meda, Majja

Site - *Drushtigata* 1st, 2nd, 3rd *Patalgata dosha* vitiation

Symptoms^{-15,16}

Blurring of vision (*Avyaktani sa rupani*),

Difficulty in near work (*Suchipasham na pashyati*)

Altered brightness (*Rupani aachhaditani ev vasasa*)

Central scotoma (*Karna nasakshi yuktani viparitaniveekshyate*)

Distorted vision –Metamorphosis, Micropsia, Macropsia (*Drushti gochar vibhramat*)

Complications (*Upadrava*)

Loss of vision (*Chakshurendriya shakti nasha - Linganasha*)

Management

Treatment should be *Rakta, Pitta shamaka, Rakta prasadana* and *Vata niyamana*. *Yogas* described in *Vataja timira* should be used in dry A.M.D. & *Yogas* described in *Plttaja timira* 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.

Prevention-

Hetu parivarjan (Avoiding causes of eye diseases) -

Altered sleep pattern (shift duties), prolonged near work activity (working on digital media), Unhealthy food consumption (fermented, spicy, heavy to digest). Diets high in refined carbohydrates increase the risk of AMD, which was confirmed in a study published in the American Journal of Clinical Nutrition. Examples of refined carbohydrates include white bread, white rolls, baked white potatoes, donuts and pretzels. According to *Ayurveda*; Brinjal, Lady finger, Jackfruit, Curd, Pickles, Lemon, Oily-Spicy food should be avoided.

According to the Eye Digest, high fat intake is associated with an increased risk of macular degeneration. Both saturated and unsaturated fats can create a higher risk.

Consuming beef, pork or lamb more than once per week will increase your chances of getting AMD by 35%. Avoid processed foods, sugar and white flour.¹⁷

Wear Sunglasses with UV & Blue Light Protection

Some findings suggest an association between AMD and cumulative eye damage from overexposure to both UV and high energy visible (HEV) or "blue" light (emitted by smart phones, LED Televisions, computer screens).

A recent major study found that people who consumed antioxidants, in combination with overexposure to blue light, were four times more likely to develop advanced or "wet" AMD. For this reason, it is a good idea to wear sunglasses that protect against both UV and HEV light.¹⁷

Following dincharya (Daily Regimen)

Anjan karma - As eyes are mainly of *teja* property, they can easily get affected by *Kapha dosha*. So regular *Anjana karma* is suggested.¹⁸ Hence regular *Anjana karma* will help in avoiding ageing effects in the eye. *Rasanjana* should be done every week.

Padabhyanga (Foot massage) will also be helpful in maintaining healthy eyes. In the centre of the feet 2 *Siras* are situated which are directly connected to the eyes, transmit the effect of the medicines applied over the feet in the form of massage. Hence every person should use *padabhyanga*.¹⁹ It is *Drustiprasaadakar* (Nourishes eyes). *Abhyanga*, through its *Vaata* ameliorating action is responsible for better function of *Chakshurindriya*.

According to *Bhelasamhita* as *Alochaka Pitta* present in the *Paada* whereas other references consider *Alochaka pitta* present in the eyes. By doing *Paada Abhyanga* we stimulate the *Alochaka pitta*, which enhances the visual acuity. The *Abhyanga* is exceedingly beneficial to the skin. As *Vaayu* is found predominantly in the *Sparshanedriya*, it can be controlled by *abhyanga*. *Indriya* is a close contact of *Manas*, hence if *Indriyas* remain healthy, mind also automatically remains healthy. It gives positive effect on eyes.²⁰

Healthy Diet (Hitakara ahara)- Ghruta, Patola, Mudga (Phaseolus Radiatus Linn.), Shatavari (Asparagus Racemosus Willd.), honey, Dadim (pomegranates) should be included in diet.²¹ Veggies and fruits with carotenoids (beta-carotene, lutein, zeaxanthin) and vitamin C (Kale, collards, bell peppers, broccoli, sweet potato, spinach, green peas, pumpkin, carrots, Swiss chard, peaches, blueberries, oranges, tangerines, mangos, tomatoes, apricots, papaya, cantaloupe, honeydew, avocado, grapefruit).

Foods high in vitamin E (Sunflower seed kernels, almonds, peanuts, fortified cereals, wheat-germ oil, fortified soymilk, sunflower oil, canned tomato products, turnip greens, tofu).

Foods that provide zinc (Alaskan king crab, lamb, bulgur, fortified breakfast cereal, dried beans, pork, poultry (dark meat), whole-wheat and buckwheat flours, pumpkin seeds).

Fish high in omega-3 fatty acids (Salmon, mackerel, herring, lake trout, sardines, albacore tuna) Omega-3 fatty acids can also be found in nuts, such as walnuts.

A study published by researchers at the Massachusetts Eye and Ear Infirmary reported that people who consumed the most vegetables rich in carotenoids (lutein and zeaxanthin) had a 43 percent lower risk of AMD than those who ate these foods the least.

Choose healthy fats. Healthy unsaturated fats, such as the fats found in olive oil, may help protect your vision. Choose these healthy fats over saturated fats, such as butter, and trans fats, such as partially hydrogenated oils found in packaged foods. Choose whole grains over refined grain. Choose whole grains, such as whole-wheat bread, over refined grains, such as white bread.^{22,23}

Exercises - Two studies by the American Academy of Ophthalmology found that people who exercise regularly were less likely to develop serious eye disease. In one study, people who engaged in moderate physical exercise were 25% less likely to develop glaucoma than people who were largely inactive. Another study showed that people who exercised three times a week were less likely to develop age-related macular degeneration than people who didn't exercise.

Regular exercise reduces macular degeneration risk, according to a study in the British Journal of Ophthalmology. Researchers found that people who led an active lifestyle were 70 percent less likely to have AMD develop during the follow-up period.²⁴

Eye Exercise

In tired eyes or difficulty in sustaining attention, eye exercises may help. It is said that just a few minutes of exercises per day can make your eye muscles stronger and your vision can actually improve.²⁵

Palming, Distant and near focusing, Rotational movements of eye will help to strengthen eye power. Eye exercises help to increase retinal blood flow & improvement in vision.²⁶

Exercises for Macular Degeneration- Since peripheral vision is not destroyed during AMD, patients can be trained to make best use of the remaining vision. Eccentric Viewing, Eye Exercises to avoid Blind Spots, Eye-Exercises to improve Reading Skills are advised by occupational therapists.²⁷

Yogic Kriya-

Vision is possible only when Soul (*Aatma*), Mind (*Mana*), Eye (eyeball) and Visual centers (*Netrendriya*) act collectively. *Yogik kriyas* will help efficient working of *Netrendriya* by pacifying mind. *Trataka* (concentrating on specific object/candle light), *Bhramari* will help to improve *Netrendriya bala* and delaying degenerative changes.²⁸

Apart from the preventive aspect, *yoga* can improve the basic level of health in all its aspects including mental, social and spiritual components which is recognized by WHO in its definition of health. *Yoga* as defined by Sri Aurobindo says that, this is a technique to improve the total personality of the individual at physical, mental, emotional, social and spiritual levels. Hence it is very important to take up *yoga* on a regular basis from youth itself to prevent these problems. This process of promotion of positive health is necessary for delaying the whole ageing process to maintain youth for long time.

Once the ageing changes of the eye have started, regular practices of *Tratakas* for 20 minutes, two times a day can prevent the progression of the disease and also improve the vision. The basic set of 8 *Asanas*, *Pranayama* and meditation through chanting of A,U,M, and Om; also help in improving ageing changes & A.M.D. Some researchers also proved that psychological instability worsened the condition in A.M.D.^{29,30}

Surya namaskara (Sun salutation)

Eye & the Sun are having *Tejabhoota* dominance. Sun salutation, is supposed to help in maintaining *Alochaka pitta* healthy and thus maintaining visual acuity. The practice of *Surya namaskara* as a whole gives a great number of benefits.

It stimulates and balances all the systems of the body, including the endocrine, circulatory, respiratory and digestive systems. Its influence on the pineal gland and the hypothalamus helps to prevent pineal degeneration and calcification. Synchronizing the breath with the physical movements of *Surya namaskara* ensures that, the practitioner, at least for a few minutes daily, breathes as deeply and rhythmically as possible.

This removes carbon dioxide from the lungs and replaces it with fresh oxygen, increasing mental clarity by bringing fresh, oxygenated blood to the brain.

To conclude, *Surya namaskara* is the ideal practice to increase health and wellbeing and prolong degenerative changes.³¹

Curative treatment

Ayurvedic medicines are very helpful to give strength to retina and to improve the power of vision. It is very important to start the treatment of wet type Macular degeneration from the very start of the disease otherwise persistent edema will harm the retina very badly and the vision will not be reversed in such cases.

Below mentioned are the main treatment procedures done to treat Macular degeneration.

- a) *Virechana*
- b) *Thakradhara* in wet form of Macular degeneration
- c) *Nethradhara*
- e) For dry form of Macular degeneration- Oil *Shirodhara*

Kriyakalpa (Local eye treatments) - After body purification *Rasayana* therapies along with *Netra Kriya-kalpa*'s should be used as:

1 Seka: *Netra seka* with *Triphala kwatha* (An eye wash using medicated *Kashayam*.)

2 Anjana: An application of medicine in the form of paste to the eye. (*Rasanjan, Haritakyadi varti, Sarivadi Varti*)³²

3 Aschotana: An administration of eye drops to the eye.

4.Tarpana: Keeping medicated ghee over the eye for a stipulated period, making concentric boundary around the orbit.

Tarpana with *Triphala, Goghrita, Shatavhadi ghruta, Jeevantyadi Ghruta*.³² (mentioned in *Timir chikitsa*) will be helpful in A.M.D.

5. Putapaka: Keeping medicaments prepared out of plant extracts, fats & certain minerals over the eye for a

stipulated period, making concentric boundary around the orbit.

Chakshushya Rasayana Medicines- *Amalaki (Emblica officinalis Gaertn)*, *Haritaki (Terminalia chebula Retz.)*, *Bibhitaki (Terminalia bellirica Roxb.)*, *Nirgudi (Moringa oleifera Lam)*, *kumari (Aloevera Tourn,ex Linn.)*, *drakshya (Vitis vinefera Linn)* are *Chakshushya*, anti oxidant^{33,34}, anti inflammatory³⁵ and neuroprotective. They can be added in *Pitta, Rakta* vitiation (wet A.M.D.)

In one clinical study, *Vayshapana gana* medicines described in *Charaka*; viz. *Shatavari root- Asparagus racemosus*, *Amalaki fruit - Emblica officinalis*, *Haritaki fruit - Terminalia chebula*, *Poonarnava root - Boerhavia diffusa*, *Guduchi bark - Tinospora cordifolia*, *Rasna root - Pluchea lanceolata*, *Shaliparni patra - Desmodium gangeticum*, *Mandukparni panchanga - Centella asiatica*, *Jivanti root - Leptadenia reticulata*, *Aparajita bark - Clitoria ternate* were used for *Nasya & Basti* in A.M.D.³⁶

Kalpas - *Amalaki rasayana*, *Triphala ghruta*, *Vasakadi kashayam* are useful in A.M.D.

DISCUSSION AND RESULTS

As Geriatric eye disorders occur due to degenerative changes in retina (*Drushtigata doshdushti*); only local treatment will not be helpful. Senile disorders are difficult to treat due to "*Swabhavabala pravrutattva*". As per principle of *Ayurveda*, "*swasthasya swasthya rakshana*" prevention is always better. Preventive measures like *Hetupariverjan*, Following *Dincharya*, *Rasayana chikitsa* (rejuvenation 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 "*Netra Raksha Vidhi*". We can delay ageing process by using *Chakshushya Rasayana* medicines (rejuvenation therapy), starting in early age; as many *Chakshushya dravya* possess antioxidant properties. *Ayurveda* considers body, mind and sense organs collectively for the treatment of any disease. Therefore, Eye exercises and *yogic* procedures will also helpful in geriatric eye diseases.

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.M.D. and other geriatric eye conditions are multi factorial, combined therapy with preventive measures, *Chakshushya Rasayanas*, eye exercises & *yoga* will be more beneficial than a single drug therapy. Thus we can tackle Geriatric eye disorders very well by Holistic approach with combined therapy with *Ayurveda*, eye exercises & *yoga*.

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