



SAPTAMRUT LOHA-THE BEST ANTIOXIDANT FOR ARMD

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ABSTRACT Antioxidants are nutrients that protect cells from damage caused by free radicals—molecules associated with aging. Too many free radicals can cause eye disease, including advanced age-related macular degeneration (ARMD). Antioxidants keep the creation of free radicals under control and help protect and repair cells damaged by them. The National Eye Institute recommends a diet high in antioxidants, plus vitamin and mineral supplements, for all people with age-related macular degeneration (ARMD).

Common antioxidants include vitamin C, vitamin E, vitamin A, selenium and zinc. They are generally found in foods with strong colors, particularly orange, yellow, red and dark green fruits and vegetables.

In Ayurved, nearly 5000 years ago, the drug was introduced called as Saptamrut Loha which proves to be very effective in this age too, for ARMD.

It is a combination of the best herbs—Triphala, Yashtimadhu, Loha Bhasma to be taken with ghee and honey. This combination proves to fulfill all the supplementation of antioxidants there by helps the progression of ARMD and helps in maintaining the vision preventing further loss of visual acuity. Historically, plants are well known for their medicinal value, mainly related to their phytochemical component content, including phenolic compounds, flavonoids, alkaloids, tannins, and other stress-responsive products. Indeed, plant-derived antioxidants, especially polyphenol compounds, have proven success in minimizing the levels of toxic free radicals and relieving different oxidative stress-mediated diseases

KEYWORDS : ARMD, Antioxidants, Triphala, Yashtimadhu, Loha Bhasma, Ghee, Honey.

Introduction-

Age related macular degeneration is associated with the deterioration of macular function due to ageing. Macula is most important part for good vision (Visual acuity). Slightest damage to macula especially to its central part (fovea) causes profound disturbance in the vision. This disturbance is usually severe, irreversible in elderly people.

It is estimated that 20-25 million people suffer from ARMD worldwide, out of which nearly 8 million experience blindness1.

Clinical Features of ARMD-

Main symptom is blurring or loss of vision and a black area in visual field (Scotoma)

Objects may appear smaller (micropsia), distorted, large (macropsia) due to ARMD.

Pathophysiology of ARMD-

There are two main types of ARMD-Dry and Wet

Dry ARMD-

Starts with yellow, tiny deposits in macula, resulting in death of nerve cells of macula. Macula loses its normal color and appears white and lusterless.

Signs of Dry ARMD-

Drusen bodies are seen in initial stage. (Drusen bodies are discrete yellow deposits in macula due to degeneration of retinal pigment epithelial cells).

In late stage, atrophy and scarring are seen.

Wet ARMD-

In this type, abnormal, leaky vessels grow in the macula. This leakage leads to accumulation of blood and fluid at macula.

Signs of Wet ARMD-

Hemorrhages and subretinal neovascularization is seen very clearly. This leads to severe vision loss.

Management of ARMD-

It includes antioxidants, photocoagulation or intravitreal injection of Avastin (anti vascular endothelial growth factor antibodies).

But these treatments are expensive and many times out of reach of common man.

So the need to find out the alternative treatment for ARMD, question

arises what help Ayurved can do? And while going through classical texts in this context, a very cheap but effective combination attracted me and I made up my mind to study this combination and to my surprise, I realized that nearly 5000 years ago, the best antioxidant was prepared by our Acharya to keep eyes healthy with the same logic and precision on which the modern antioxidants are formulated.

Before understanding the action of the antioxidants, we must understand the oxidation process and its ill effect on our body especially on eyes.

First, it is important to understand what free radicals are. Free radicals are atoms that lack a particle called an electron, and, as a result, are very unstable. In the free radicals' attempt to become stable, they attack other cells as they try to "steal" an electron. This attack harms the cells' delicate membranes and makes them a target for disease.

When free radicals steal electrons from healthy cells it is called oxidation. Just like oxygen causes metal to rust, oxidation can also damage cells. In humans, the common signs of oxidative damage can be seen in the normal signs of aging: skin changes such as the appearance of wrinkles, and ocular changes, including the development of cataracts and macular degeneration.

Antioxidants are nutrients that protect cells from damage caused by free radicals—molecules associated with aging. Too many free radicals can cause eye disease, including advanced age-related macular degeneration (AMD). Antioxidants keep the creation of free radicals under control and help protect and repair cells damaged by them.

The National Eye Institute recommends a diet high in antioxidants, plus vitamin and mineral supplements, for all people with age-related macular degeneration (AMD).2

Sources of Antioxidants

Common antioxidants include vitamin C, vitamin E, vitamin A, selenium and zinc. They are generally found in foods with strong colors, particularly orange, yellow, red and dark green fruits and vegetables:

- Vitamin C: oranges, grapefruit, cantaloupe, berries, mangoes, kale, Brussels sprouts, peppers, sweet potatoes and tomatoes
- Vitamin E: broccoli, pumpkin, spinach, carrots, turnip greens, papaya and sunflower seeds
- Vitamin A: carrots, cantaloupe, corn, nectarines, peaches, pumpkin, squash, sweet potatoes, tomatoes and watermelon
- Selenium: Brazil nuts, whole grains, tuna, beef and dark meat

turkey

- Zinc: oysters, nuts, seafood, red meat, beans and dairy
- Other foods high in antioxidants include prunes, plums, apples, berries, eggplant, onions and alfalfa sprouts³.

Saptamrut Loha-

As the name suggests, it contains seven medicines and it acts like elixir (Amrut in Sanskrit). Out of seven ingredients, a tablet is made up of five medicines and it should be taken with cow's ghee and honey. Thus it makes a combination of seven drugs so called as Saptamruta Loha.

Saptamrut Lauha is an Ayurvedic medicine in tablet or powder form. It is mainly used in the treatment of eye disorders, gastritis, abdominal colic, etc. It contains Iron Bhasma as its main ingredient.

Saptamrut Loha ingredients:

10 g fine powder of each of

Yashti – Licorice – Glycyrrhiza glabra – 10 g

Haritaki – Chebulic Myrobalan fruit rind – Terminalia chebula – 3.33 g

Vibhitaki – Belliric Myrobalan fruit rind – Terminalia bellirica – 3.33 g

Aamalaki – Indian gooseberry fruit – Emblica officinalis Gaertn. – 3 . 3 3 g

Loha Bhasma – Bhasma prepared from Iron – 10 g

Reference: Bhaishajya Ratnavali Shoola Rogadhikara 83 – 84

Manufacturers: Baidyanath, Dabur, Divya Pharmacy

Sanskrit Verse describing the medicine

मधुकं त्रिफलाचूर्णमयोरजः समं लिहन् ।

मधुसर्पिर्युतं सम्यक् गव्यक्षीरं पिबेदनु ॥

छर्दिं सतिमिरं शूलमम्लपित्तं ज्वरं क्लमम् ।

आनाहं मूत्रसङ्गञ्च शोथञ्चैव निहन्ति तत् ॥ Bhaishajya Ratnavali^{4ax}

As far as Ayurved is concerned, Triphala works as Rasayan. Yashtimadhu is also a rasayan drug. Loha Bhasma works on Rasa Rakta dhatu there by enhancing the body immunity. Cow's ghee is best medicine to enhance the Agni there by boosting the immune system. Honey is also beneficial to human body as it works as cleansing agent. Thus all the ingredients in Saptamrut Loha work on Agni in all enhancing the immune system and helps human being to keep himself healthy.

As far as modern pharmacology is concerned, lot of research has been done on these ingredients by taking their aqueous extracts, alcoholic extracts and in vivo and in vitro studies were also conducted by various agencies proving that what is written in Ayurvedic texts about these herbs are perfectly correct and the herbs are very beneficial to mankind in one or the other way.

We will now review the active ingredients of these herbs which are constituents of Saptamrut Loha-

Triphala-It is a combination of three fruits-Haritaki-Terminalia chebulic, Bibhitaki-Terminalia belerica and Aamalaki-Emblica officinalis

Terminalia Chebula Extract Active Ingredient : Tannins 40% & Tannins 60%

Common Name : Myrobalan, Chebulic Myrobalan

Chemical Constituents and Components : Main chemical constituents are chebulagic acid, chebulagic acid, corilagin, beta-sitosterol, gallic acid, ellagic acid, ethyl gallate, tannic acid, galloyl glucose & chebulagic acid.

Action:

Tannins: 1. It is a potent suppressor of T cell activity.

2. It blocks the cytotoxicity, mediated by cytotoxic T lymphocyte.
3. It shows antibacterial activity against gram positive and negative bacteria.
4. It possesses antimicrobial activity and inhibits xanthine oxidase.
5. It shows strong scavenging activity against free radicals and inhibits reactive oxygen species production from leucocytes.

Research Information: Terminalia chebula seed powder or extract possesses potent Antidiabetic activity.

It causes reduction in blood sugar and enhances secretion of insulin from the beta cells of Langerhans or through extra pancreatic mechanism.⁵

Terminalia belerica-Bibhitak

Chemical Composition

It contains several triterpenoids including Belleric Acid, Britosterol and the Saponin Glycosides, Bellericoside and Bellericanin.

Its principle constituents are beta-sitosterol, gallic acid, ellagic acid, ethyl gallate, galloyl glucose and chebulagic acid.

Biological activities of gallic acid includes-analgesic, Antiallergic, Antibronchitic, anti-inflammatory, antioxidant, antiviral, bactericidal, bronchodilator, immune-suppressant and astringent⁶.

Emblica officinalis-Aamala

In animal research, amla appears to be able to reduce triglycerides and better the cholesterol profile as well as benefit cardiovascular health (the heart and vessels themselves). Most of these actions are attributed to its antioxidant properties, which are partially derived from a high Vitamin C content but also from a large amount of tannin compounds that are also found in other potent antioxidants like camellia sinensis and dimocarpus longan.

The components of emblica officinalis include⁷ (fruit unless otherwise specified):

- Phyllemblin
- Emblicanin A and B (major tannoids) which can be hydrolyzed to form gallic acid and ellagic acid with glucose (Emblicanin A) or ellagic acid with glucose (Emblicanin B)
- Punigluconin and pedunculagin
- Putranjivain [
- Tannin structures elaeocarpusin and chebulagic acid and various configurations of these tannic acids with gallic acid
- β-glucogallin (1-O-galloyl-β-d-glucose
- Gallic Acid [
- Phytosterols including β-sitosterol (12.12±/1.90mg/100g), stigmasterol (0.70±/0.21mg/100g), and campesterol (0.26±/0.02mg/100g) as well as trihydroxysitosterol and 5α,6β,7α-acetoxysitosterol.
- Carotenoids including lutein (49±/27mg/100g) and β-carotene (32±/19mg/100g)
- Vitamin C
- (2% of fruit juice[18] or 575±/452mg/100g of the fruits (wet weight)
- Vitamin E
- at 0.16±0.05mg/100g fruit wet weight
- Calcium (42±/12mg/100g), Sodium (13±/4mg/100g), Phosphorus (21±/5mg/100g), Potassium (151±/37mg/100g or 1.16±/0.05%), Magnesium (13±/2mg/100g), Manganese (0.71±/0.06mg/g) Iron (0.16±/0.04mg/100g), Copper (0.04±/0.03mg/100g), chloride (25.6±/2.3mg/g) and Zinc(0.14±/0.08mg/100g with the content varying depending on analysis technique

The total phenolic content of the fruits appears to be 3703±/1244mGAE/100g (Gallic acid equivalents) and the total tannoid content (emblicanins, Punigluconin, gallic acid, rutin, and pedunculagin) consist of approximately 10-13% of the fruit by dry weight Despite the fruits having no detectable fatty acids, the seeds possess oil that is rich in linoleic acid (44.0%) and oleic acid (28.4%).

Glycyrrhiza Glabra- yashtimadhi

The most abundant minerals detected in licorice in both tea and infusion forms were calcium, sodium, phosphorus, potassium and iron, respectively. Zinc and copper were detected as trace elements.

Essential and non-essential amino acids were present in all licorice forms. HPLC analysis of the organic acids in licorice forms showed the presence of several aliphatic acids such as butyric acids, tartaric acid and acetic acids.

The methanol extract of licorice showed cytotoxic activities against intestinal carcinoma cell line (Caco-2) and prostate carcinoma cell line (PC-3) with IC50 values of 40 and 40.6 µg/ml, respectively.

The effects of licorice in infusion and tea forms on body weight gain,

white and red blood cells, hemoglobin and blood platelets, liver enzymes, kidney functions, total cholesterol and triglyceride levels, and some serum mineral levels were studied *in vivo*⁸.

Cow's Ghee-Goghru- Nutritional Value of Ghee

Ghee may be composed primarily of fats, but it also contains significant levels of vitamin A, vitamin E, and vitamin D.

Although many people think of fat as an unhealthy element to the diet, the body needs fat to function.

Omega-3s (monounsaturated fats) are healthy forms of fat that can be found in ghee, in addition to other fatty acids like conjugated linoleic acid and butyric acid, both of which have positive health benefits in the body⁹. **Eye Health and Cow's Ghee-**

Ghee consists of significant amount of vitamin A which is ideal for protecting eye health. Carotenoids are antioxidants that specify in eliminating and neutralizing the free radicals that attack the macular cells, thus avoiding macular degeneration and the development of cataracts¹⁰.

Antioxidant Activity of Cow's Ghee-

The health benefits of vitamin A are widely exposed and the powers of carotenoids in terms of eliminating free radicals in the body are extremely valuable. When you add the antioxidant capacity of conjugated linoleic acid and butyric acid to the power of vitamin A contained in ghee, you have a powerful anti-cancer substance that might help reduce oxidative stress throughout the body.

Loha Bhasma-

Loha Bhasma is an Ayurvedic medicine prepared from Iron¹¹. It is used in Ayurvedic treatment of anemia, eye disorders, skin diseases etc. This medicine should only be taken strictly under medical supervision.

Lauha Bhasma Uses:

- It is nourishing, sweet, sour and bitter in taste.
- It is coolant in nature and heavy to digest.
- It has scraping quality, hence useful in cardiovascular diseases.
- It improves strength, immunity, skin texture, complexion, memory, intelligence, digestive power and acts as natural aphrodisiac.
- It is useful in gastric complaints, skin diseases, eye disorders, bloating, splenomegaly, helminthiasis, obesity, diabetes, vomiting, asthma, bronchitis, herpes, abdominal colic, chronic respiratory disorders, liver disorders, piles, fistula, chronic diseases, emaciation, muscle wasting, dizziness, delusion.

Effect of Lohabhasmam on Tridosha – Balances Kapha and Pitta.

Chemical composition: Iron – Fe.

Honey-

Antioxidant-rich¹². Honey contains phenols, enzymes, flavonoids, and organic acids — all of which play a crucial role in honey's laundry list of health-positive benefits¹³.

Discussion-

Free radicals and oxidants are produced either from normal cell metabolisms *in situ* or from external sources (pollution, cigarette smoke, radiation, medication, metabolic disorders). When an overload of free radicals cannot gradually be destroyed, their accumulation in the body generates a phenomenon called oxidative stress. This process plays a major part in the development of chronic and degenerative illness such as cancer, autoimmune disorders, aging, cataract, rheumatoid arthritis, cardiovascular and neurodegenerative diseases. The human body has several mechanisms to counteract oxidative stress by producing antioxidants, which are either naturally produced *in situ*, or externally supplied through foods and/or supplements. This mini-review deals with highlighting the potential role of the antioxidants in preventing and repairing damages caused by oxidative stress especially ARMD, and it discusses the antioxidant supplementation in health maintenance¹⁴.

Oxidative stress is generally considered as a risk factor triggering the development of various critical pathologies, including cancer, arthritis, atherosclerosis, diabetes, autoimmune disorders, and

cardiovascular and neurodegenerative diseases. Historically, plants are well known for their medicinal value, mainly related to their phytochemical component content, including phenolic compounds, flavonoids, alkaloids, tannins, and other stress-responsive products. Indeed, plant-derived antioxidants, especially polyphenolic compounds, have proven success in minimizing the levels of toxic free radicals and relieving different oxidative stress-mediated diseases.

Ferrous fumarate (a form of iron) is often added to foods in an effort to prevent iron deficiency. Vitamin C can improve the amount of iron that the body absorbs; therefore it is often added to foods too. However, we don't know if vitamin C really increases the absorption of iron from ferrous fumarate¹⁵.

Precision and rational of Saptamrut Loha as antioxidant in ARMD-

Loss of vision due to ARMD is irreversible in many cases. It is therefore important to prevent it. Antioxidant offers a ray of hope in this regard as they have the potential to prevent the occurrence and progression of the disease.

ARMD is the result of photo oxidative induced retinal injury especially macula resulting in squal.

The macula needs lots of oxygen and is continuously exposed to light. Due to this exposure, large number of free radicals is produced there. Free radicals are toxic and unstable compounds and causes retinal cell damage. Over a period of time (say of some years) these free radicals injure the nerve cells in the macula, leading to its degeneration. They are produced in great number when a person is exposed to tobacco, cigarette smoking, UV radiation, air pollution for longer time. Also people suffering from diabetes, hypertension is more victims of this free radical production due to metabolic imbalance.

This is the reason that macular degeneration is seen now days in people of 40-50 years of age as due to lifestyle alterations ageing process is also fastened now a days and ARMD, which occurs earlier in the age group of 65 and above. It is no longer age related now. As the changing lifestyle, changing work pattern, continuous exposure to computer and mobiles, unhealthy food, exposure to bad habits like tobacco, smoking, alcohol etc., untimely sleep and above all like cherry on cake, stress, is leading young generation, middle aged people to macular degeneration along with diabetes, hypertension, depression etc.

The longer one gets exposed to above things, the earlier that person becomes victim of macular degeneration.

So antioxidants are best defense against free radicals. Antioxidants acts like scavengers thereby neutralizing free radicals and ultimately limiting damage to macula.

Vitamin A, C & Minerals like Zinc n Selenium, Carotenoids like lutein & Zeaxanthine which are present in constituents of Saptamrut Loha acts as antioxidants.

Adverse effects of Antioxidants-

Lutein and Zeaxanthine are well tolerated without any side effects.

Beta Carotene increases risk of lung cancer in smokers.

Vit E increases risk of heart failure in patients with vascular disease or diabetes and Zinc causes problem in genitourinary tract.

Conclusion-

ARMD is a disease of old age which leads to irreversible vision loss.

The treatment options are few and usually not much successful in restoring vision.

Historically, plants are well known for their medicinal value, mainly related to their phytochemical component content, including phenolic compounds, flavonoids, alkaloids, tannins, and other stress-responsive products. Indeed, plant-derived antioxidants, especially polyphenolic compounds, have proven success in minimizing the levels of toxic free radicals and relieving different oxidative stress-mediated diseases

The antioxidants prevent damage to macula caused by free radicals and are beneficial in retarding the progress of ARMD. They are also helpful in preventing onset of ARMD.

Based on current evidence, Lutein and Zeaxanthine are definitely

indicated in patients of ARMD. Wet ARMD gives good results as compared to dry with antioxidant therapy. However antioxidant therapy should not be routinely recommended in elderly people for primary prevention of ARMD due to lack of sufficient evidence in this regard and also to avoid the side effects of antioxidants.

An ideal ocular supplement should include all antioxidants described above to give maximum protection against free radicals without causing adverse effects. And the best combination is Saptamrut Loha.

The National Eye Institute (NEI) is part of the National Institutes of Health (NIH) and is the Federal government's lead agency for vision research that leads to sight-saving treatments and plays a key role in reducing visual impairment and blindness.

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