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Conceptual Study of *Annavaha Srotas* and its *Viddha lakshana* with special reference to *Andhya:* Short Communication

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ABSTRACT:

Annavaha Srotas (gastrointestinal channels) are essential for the food and sustenance of all bodily tissues, including ocular structures. *Ayurveda* emphasizes the link between digestion, systemic health, and ocular problems, including blindness. According to classical *Ayurvedic* writings, vitiation of *annavaha srotas* caused by poor food, lifestyle, and aggravated *doshas* can result in inadequacies impacting eye health. This paper examines the pathogenic involvement of *annavaha srotas* in ocular illnesses, particularly blindness, using *Ayurvedic* concepts and comparing them to modern medical discoveries. In modern medicine, blindness is frequently connected with nutritional deficits, metabolic problems, and degenerative illnesses of the optic nerve and retina. Vitamin A deficiency, diabetic retinopathy, and ischemic optic neuropathy have been related to malnutrition and metabolic dysfunctions, supporting *Ayurveda's* theory of diminished *agni* (digestive fire) leading to systemic illnesses. This review article tries to bring together *Ayurvedic* and modern perspectives, emphasizing the importance of gut health in ocular illnesses and arguing for an integrative approach to blindness prevention and therapy.

KEY WORDS: *Annavaha Srotas*, *Ayurveda*, Blindness, Digestion, Ocular Health.

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INTRODUCTION:

The idea of *srotas*, or channels or routes, is central to *Ayurvedic* medicine's understanding of the physiological mechanisms governing the body's operations. These channels are in charge of moving different materials throughout the body, including nutrition, wastes and important energies. The *annavaha srotas*, one of the numerous *srotas* found in *Ayurveda,* is particularly important since it

regulates digestion and makes sure that food and nutrients are properly absorbed. Their health and function are closely related to the health of the body as a whole.

With an emphasis on *annavaha srotas*, this review article explores the intricate workings of *srotas* in general and their significance in preserving bodily balance and sustaining important activities. We hope to improve knowledge of how these channels support the body's physiological balance by looking at both the classic *Ayurvedic* ideas and their contemporary interpretations. Specifically, the connection between digestive health and the *annavaha srotas* will be examined, providing information on how *Ayurvedic* practices can support the best possible body function and overall health.

Srotas

The pathways by which nutrient substances are supplied to cells and tissues via the process of transudation is called as *srotas*. Because they make it easier for necessary components to be transported and distributed to various organs and systems, these channels are crucial for preserving equilibrium and overall health. Many *srotas* are linked to particular body functions in *Ayurveda*, including *rasavaha* (channels for plasma), *raktavaha* (channels for blood), and *udakavaha* (channels for water). Since blockages or dysfunctions in these channels can result in a variety of health problems, it is essential to comprehend how *srotas* operate and health in order to diagnose and cure imbalances. This idea is central to *Ayurvedic* treatments that include cleansing, dietary changes, and therapies that facilitate the body's natural flow of chemicals to restore and sustain health.

Acharya	***Moolsthan***
Acharya charaka	*Amashaya, vamparshava*
Acharya sushruta	*Amashaya, annawahi dhamni*
Ashtang Samgraha	*Amashaya, vamparshava*

Annavaha Srotas

The channels that handle food intake, digestion, and assimilation (*Anna*) are referred to as *Annavaha Srotas*.

The *Annavaha Srotas* are mostly linked to the process of food digestion and absorption, which results in the development of *Rasa*, the initial tissue generated following digestion, which is subsequently changed into the successive tissues. When *annavaha srotas* are functioning effectively, food is properly absorbed, digested, and converted into essential nutrients. Impaired food passage through the digestive system can result in *aam*, which is the underlying cause of many illnesses.

Ayurveda classics highlight the relationship between an individual's general health, *agni*, and the digestive channels.

Moolsthan* of *annavaha shrotas

अन्नवहानां स्रोतसामामाशयो मूलं वामं च पार्श्वं | [1]

अन्नवहे द्वे, तयोर्मूलमामाशयोऽन्नवाहिन्यश्च धमन्यः | [2]

अन्नवाहिनामामाशयो मूलं वामपार्श्वश्च||१|| [3]

Table- 1: The *Moolasthan* according to *Acharya*:

Amashaya

1. *Charaka* claims that *amashaya* is located between *nabhi* and *stana*. It has been split into two sections by *agni* of *Chakrapanidatta: urdhwa amashaya* and *adhoamashaya.*

2. *Sharangdhar* claims that *amashaya* is located beneath *shleshmashaya*, which is located in *urah*.[4]
3. *Hridaya*, the substrate of *sattva, rajas,* and *tamas*, is situated between two *stana* in the chest at the *amashaya dwar.* [5]
4. *Pitta's* sites include *sweda, rasa, lasika, rudhira*, and *aamashaya.* The main place of *pitta* is *aamashaya.* [6]

Vamparshava

- It is chief organ of *annavaha srotas* and situated in *vamaparshwa* (Lt. hypochondriac region).

Annavahi Dhamani

- The second moola of *annavaha srotas* is said to be *annavahi dhamani.* The term *anna vahinee or anna nadi* refers to a tube structure that runs from the mouth to the stomach.
- *Annavahi dhamani*, according to certain *Acharyas,* is the oesophagus. Since *dhamani* is one that bears *rasa raktadi drava dhatu*, it is unfair to evaluate the oesophagus in this case.
- The oesophagus, or *annanadi,* is located behind the trachea, or *swasa nadi.* It widens like a funnel below, travels through the diaphragm, and enters the abdominal cavity before continuing as the stomach, or "*aamashaya.*"

Causes for the Vitiation of the Channels

अतिमात्रस्य चाकाले चाहितस्य च भोजनात् | अन्नवाहीनि दुष्यन्ति वैगुण्यात् पावकस्य च || [7]

The alimentary canal gets vitiated as the result of over-eating, eating untimely or unwholesome meals and from impairment of the digestive fire.

Symptoms of vitiation of *Annavahi* channel

अनन्नाभिलषणमरोचकविपाकौ छर्दिं च दृष्ट्वाऽन्नवहान्यस्य स्रोतांसि प्रदुष्टानीति विद्यात् | [8]

- *Ananna-Abhilashanam* = Lack of desire for food (even when seeing delicious food, there is no urge to eat).
- *Arochaka-Avipakau* = *Arochaka* (loss of taste or disinterest in food) and *avipaka* (unpleasant effects after digestion).
- *Chhardim Cha Drishtva* = If there is a tendency to vomit.
- *Annavahani Asya Srotamsi Pradushtani Iti Vidyat* = Then, it should be understood that the digestive channels (gastrointestinal tract) have become impaired or contaminated.

विद्धस्याध्मानं शूलोऽन्नद्वेषश्छर्दिः पिपासाऽऽन्ध्यं मरणं च | [9]

- *Viddhasya* = When an organ or srotas (body channels) is injured or perforated.
- *Adhmanam* = Heaviness in the abdomen or excessive gas (bloating).
- *Shoolah* = Severe pain (in any organ or the abdomen).
- *Annadveshah* = Aversion to food or loss of appetite.
- *Chhardih* = Vomiting.
- *Pipasa* = Excessive thirst.
- *Andhyam* = Blindness (loss of vision or blurred vision).
- *Maranam cha* = and ultimately, death.

Blindness (*Andhatva*)

Andhyata, or blindness, is considered a serious *drishti mandala vikara* (ocular disorder) in *Ayurveda.* It falls under the categories of *timira, kacha*, and *linganasha,* which are progressive eye conditions that

ultimately lead to total blindness. This disorder primarily affects the anatomical and functional integrity of the eye and is linked to the vitiation of the *tridoshas—pitta, kapha,* and *vata*— with *pitta dosha* playing a predominant role.

The imbalance in *pitta dosha* disrupts the visual mechanisms, leading to inflammation, degeneration, and impaired vision. As the condition progresses, the involvement of *vata* and *kapha doshas* further exacerbates the deterioration, eventually resulting in complete blindness.

Causes *(Nidana)* of *Andhatva* (Blindness)

A. Dietary Causes (*Ahara*):

- Consuming too many foods that are incompatible, dry, or spicy.
- Excessive intake of alcoholic beverages, fatty foods, and fermented foods.
- Eye weakness is caused by a *rasa dhatu* (nutritional) insufficiency.

B. Lifestyle Factors (*Vihara*):

- Prolonged use of screens or excessive exposure to intense sunlight.
- Staying up late at night or sleeping during the day.
- Suppressing instincts (such as sneezing or sobbing).
- Eye and head traumas.

C. Systemic Diseases (*Vyadhi's*)

- Untreated *timira* and *kacha* for a long time.
- Chronic disorders like Diabetes (*madhumeha*) and Hypertension (*raktapitta*).
- Congenital *andhyata* is a genetic factor.

Importance of *Agni*

शान्तेऽग्नौ म्रियते, युक्ते चिरं जीवत्यनामयः|
रोगी स्याद्विकृते, मूलमग्निस्तस्मान्निरुच्यते ||[10]

Ayurveda emphasizes maintaining a strong and balanced *agni* through proper diet, lifestyle, and therapeutic measures because this verse highlights the fundamental role of *agni* (digestive fire/metabolic energy) in maintaining health and longevity. It states that when *agni* is balanced and stable, a person lives a long, disease-free life (*chiram jīvati anāmayah*); if *Agni* is disturbed or weakened, it leads to illness (*rogī syād vikṛte*); if *Agni* is completely extinguished (*śānte'agnau*), it results in death (*mriyate*). *Agni* is the root of all bodily functions, so its proper functioning is vital for digestion, life, and overall well-being.

Aam

दुष्टं अन्नम् अपक्वं च यत्किंचित् पच्यते न च।
संसृष्टं दोषैरत्यन्तं तत्ताम्रं परिचक्षते॥

Aam is improperly digested food, which remains in the system without undergoing proper transformation. When mixed with aggravated *doshas*, it becomes highly pathogenic, leading to disease.

***Agni (pachak pitta) - Aam* correlation**

दुष्यत्यग्निः, स दुष्टोऽन्नं न तत् पचति लघ्वपि|
अपच्यमानं शुक्तत्वं यात्यन्नं विषरूपताम् ||[11]

When the digestive fire becomes weak or imbalanced, it loses its ability to properly digest food, even if the food is light and easily digestible. Consequently, the undigested food undergoes fermentation and spoilage, eventually transforming into a toxic state within the body. This reflects the Ayurvedic concept that impaired digestion leads to the buildup of *Aam* (toxins), which can contribute to various health issues.

The verse underscores the significance of maintaining a vigorous digestive fire

(*jatharagni*) through a balanced diet and healthy lifestyle to prevent indigestion and toxin accumulation.

***Pachak Pitta* theory (According to *Acharya Sushruta*)**

- *Aam* in *amashaya,* which is *tridosha janya*, is produced as a result of consuming *pitta prakopa aahara*, which is a sour, salty, alcoholic, and extremely hot substance, and *vihara*, which is stress, strain, and linked to anxiety states.
- Since *pachak pitta* provides nourishment to the other four forms of *pitta*, there is no nourishment in *alochaka pitta*, which is present eyes, due to the existence of *aam*, which is present in *amashaya*.
- Vitiation of *dosha* will course through the blood vessel, it is the *sanchaya* & *prakopa avastha*.
- Then *dosha* ascends to the *urdhvajatru*, it is the *prasara avastha*.
- Then *dosha sthana samsraya* in *netra-rupavaha sira dushti*.
- It will cause *andhyata* in *vyakta avastha*.

Gut eye axis

Changes in gut microbiota composition as evidenced from stool samples of patients with eye pathologies are correlated with ocular inflammation. [12]

This review article also explores the expanding impact of GM on eye health, dispelling long-held beliefs about organ isolation and revealing a complex relationship between ocular disease and chemicals originating from the microbiome. Their role has been poorly understood and implicated primarily in pathologies localized to gastro intestinal system. It has come to light recently that this ecosystem is linked to both innate and adaptive immunity with the potential impact on eye health. [13]

It is becoming apparently clear that GM and its products can affect ocular health, as evidenced by its many systemic activities, even if the exact pathways of communication between the GM and the eye are still being investigated.

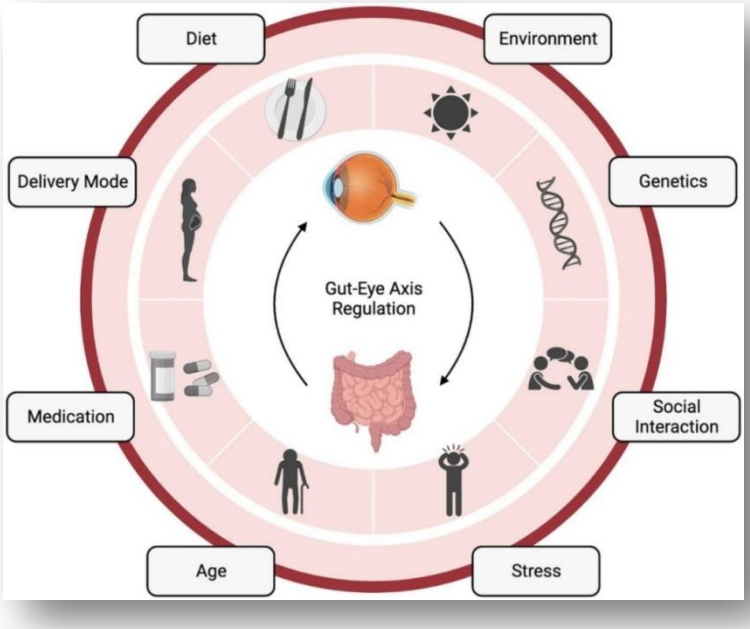

Figure-1: Gut eye axis regulation

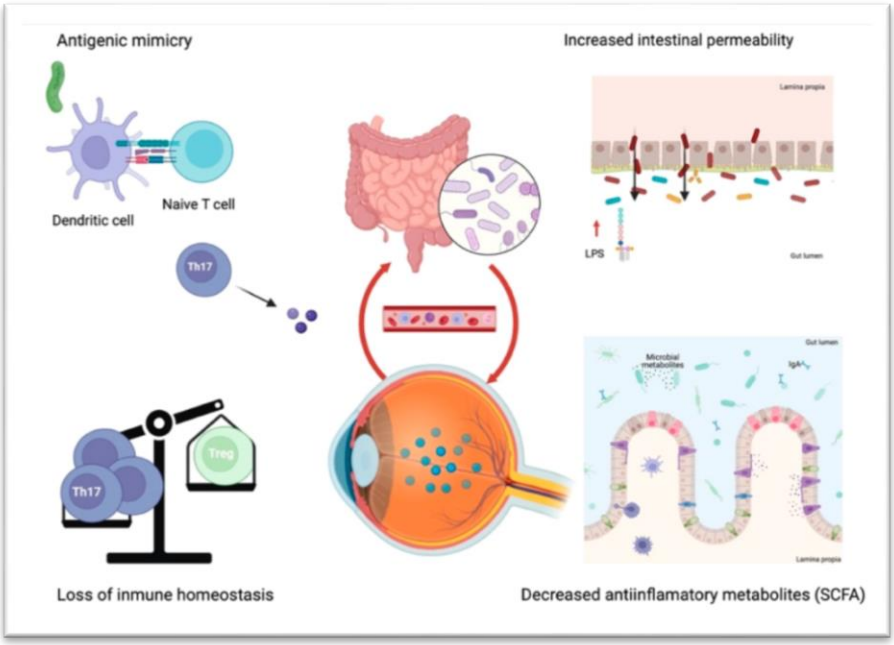

Figure-2: Gut eye axis function

Aging is a significant factor in the development of the gut-eye axis because it weakens immune regulatory signals and physical barriers, increasing permeability in the intestines and retina by weakening the three tissue layers that give the eye its immunological privilege. [14]Dietary effects, GM metabolites, and epigenetics are additional variables that may affect the development of the gut-eye axis.

Age related macular degeneration (ARMD)

Age related macular degeneration has different gut microbiota compared to those without condition. Another major cause of blindness in Western nations is age-related macular degeneration (ARMD), which primarily affects the elderly. It is believed that complement system impairment cause ARMD.

As previously mentioned, gut dysbiosis has been connected to ARMD and can result in improper complement activation, which may have an impact on the gut-eye axis.[15] Additionally, the age-related eye disease study (AREDS), one of the primary investigations in ARMD, has revealed that mineral and antioxidant supplements, particularly zinc, can slow the progression of the illness. The composition of the gut bacteria may have an impact on zinc absorption. [16]

Diabetic retinopathy

Microvascular and macrovascular complications lead to extensive organ damage, exacerbated by insulin resistance and chronic low-grade systemic inflammation.

Despite substantial advancements in early detection and treatment, diabetic retinopathy remains the leading cause of blindness among working-age individuals, significantly impacting their quality of life. Epidemiological studies indicate that nearly all patients with type 1 diabetes mellitus (T1DM) and over 60% of those with type 2 diabetes mellitus (T2DM) develop retinal impairment within 20 years of disease onset. The gut microbiota is vital for maintaining the intestinal barrier, preventing harmful

pathogens from thriving, and aiding in immune system development. It also supports nutrient absorption and produces metabolites and signalling molecules that influence various metabolic functions in the body.

Glaucoma

The gradual degeneration of retinal ganglion cells (RGCs) and associated nerve is a characteristic of glaucoma, a chronic eye disease. Complete vision loss may eventually arise from these cells' connections to the optic nerve. The idea of a gut-eye axis has recently gained traction implying that signals from the gut microbiota could cause immunological reactions in the eye. Studies have been started to find links between glaucoma and gut microbiome. However, it is still unclear which precise mechanisms the microbiota may use to cause glaucoma.

One of the potential underlying mechanisms is that:

- Dysbiosis of the gut microbiota may let toxic compounds into the bloodstream, causing systemic inflammation that disrupts the blood-brain barrier (BBB) and blood-retinal barrier (BRB), ultimately leading to neuroinflammation[17,18]
- Likewise, ocular surface dysbiosis causes an overabundance of harmful bacteria, which causes inflammation inside the eye [19].
- In the end, these inflammations harm the RGCs, which results in the development of glaucoma [20].

According to other researches, glaucoma patients have a substantially higher oral bacterial load than people without the condition, which may exacerbate its severity and course. Glaucoma is a neurodegenerative disease affecting the optic nerve. Globally, it is a leading cause of irreversible blindness. People with glaucoma have higher prevalence of gut condition IBS another the potential underlying mechanisms is that:

- The gut microbiome regulates both the concentration of neuroprotective neurotrophins and the activity of microglia in the central nervous system (CNS).
- This suggests that dysbiosis of the gut microbiome could play a role in neurodegenerative disease. It is possible that gut-mediated neuroprotection may extend to the retina and the optic nerve.
- In the end, this neuroprotection may be lost or diminished by changes in the gut microbiome, as observed in IBS.

Uveitis

The pathophysiology of a variety of immune-mediated disorders, such as multiple sclerosis, type I diabetes, rheumatoid arthritis, and ankylosing spondylitis, among others has drawn attention to the commensal microbiota and dysbiosis. Recent research has investigated the function of the gut microbiota in the development of autoimmune uveitis,

A major contributor to visual morbidity, uveitis is a diverse group of inflammatory conditions affecting the intraocular uveal tissues and surrounding structures. Examining how the gut microbiota contributes to autoimmunity, particularly the onset of uveitis, has drawn attention in recent years.

The gut microbiota has been shown to play a significant role in immune function in recent years, particularly in controlling T-regulatory cell and Th17 cell mucosal responses [21].

Chronic or recurrent uveitis can be caused by local reactivations of persistent microbial agents or inadequately cleared antigens,

which may intermittently break the proportion of T cells. Through four non-mutually exclusive mechanisms, dysbiosis contributes to the pathophysiology of uveitis [22]

- Decreased production of advantageous anti-inflammatory metabolites.
- Increased intestinal permeability leading to intestinal barrier destruction.
- Immune intestinal homeostasis loss.
- And antigenic or molecular mimicry.

Sequential formation of body tissues *(dhatu)*

रसाद्रक्तं ततो मांसं मांसान्मेदस्ततोऽस्थि च|
अस्थ्नो मज्जा ततः शुक्रं शुक्राद्भूर्भः प्रसादजः||[23]

Rasa (Plasma) → *Rakta* (Blood) → *Mamsa* (Muscle) → *Medas* (Fat) → *Asthi* (Bone) → *Majja* (Bone Marrow) → *Shukra* (Reproductive Tissue)

The step-by-step transformation of bodily tissues that ultimately leads to the creation of new life is fundamental principal in Ayurveda. It begins with *rasa*, the nutrient-rich fluid derived from digested food, which then transforms into *rakta* (blood). From blood, *mamsa* (muscle tissue) is formed, which in turn gives rise to *medas* (fat). This fat further evolves into *asthi* (bone), and from bone, *majja* (bone marrow) develops. Finally, from the marrow, *shukra* (the reproductive tissue—semen or ovum) is produced

Each *dhatu* nourishes the one that follows, reflecting the body's natural, layered construction process. This sequential development emphasizes the crucial role of proper nutrition and digestion, as the quality of each tissue relies on the effective transformation of the one before it. Ultimately, it reveals that life itself—in the form of the embryo—is the most refined and purified outcome of all these intricate bodily processes.

अस्थ्नां मज्जनि सौषिर्यं भ्रमस्तिमिरदर्शनम्||[24]

This shows how degeneration or insufficiency in the bone and marrow tissues can lead to symptoms such as fragile bones, light headedness, and visual disturbances.

Impaired absorption of nutrients

Celiac disease often leads to malabsorption of fat-soluble vitamins, which can result in various eye-related symptoms. Documented ocular issues include occipital calcifications that may impair vision, uveitis, and dry eye syndrome. In some cases, central retinal vein occlusion can be the first sign of the disease.

Vitamins and minerals such as vitamin A, Zinc, Lutin which is critical for maintaining vision are absorbed by the intestine. Unhealthy gut leads to impaired absorption of vital nutrients indirectly affecting the eye health

Unhealthy Gut

↓

Impaired Nutrient Absorption

↓

↓ Vitamin A, ↓ Zinc, ↓ Lutein

↓

Compromised Vision

DISCUSSION:

The present review highlights the intricate relationship between the gastrointestinal tract, conceptualized in Ayurveda as *annavaha srotas*, and ocular pathologies such as *andhatva* (blindness). Classical Ayurvedic literature consistently underscores the central role of *agni* (digestive fire) and the integrity of *annavaha srotas* in maintaining systemic homeostasis including ocular health as it governs digestion, assimilation, and the distribution of nutrients throughout the body. When *Jatharagni* functions optimally, food is transformed into *Ahara Rasa*, which sequentially nourishes all *Dhatus* and ensures their proper structure and activity. This balanced process keeps the *Doshas* in harmony, regulates fluid and electrolyte levels, sustains *Ojas* as the essence of immunity, and prevents *Aam* formation that could obstruct channels and disrupt body functions. Mental balance is also closely linked to digestion, since the quality of food influences *sattva, rajas, and tamas*, thereby shaping emotional and cognitive states. Eye health, too, depends on the integrity of *Annavaha Srotas*, as well-nourished *Rasa Dhatu* and efficient *Alochaka Pitta* maintain vision and protect against ocular fatigue, dryness, or weakness. In this way, *Annavaha Srotas* provides the foundation for both systemic and sensory well-being.

The manifestation of ocular disorders as a consequence of impaired digestion, as noted in the vitiation of *annavaha srotas*, is corroborated by symptoms such as anorexia, nausea, vomiting, and ultimately, visual disturbances including blindness.

This Ayurvedic concept finds striking parallels in modern biomedical research, particularly in the evolving understanding of the gut-eye axis. Recent evidence suggests that gut microbiota dysbiosis contributes to systemic inflammation, immune dysregulation, and metabolic dysfunctions—all of which are implicated in ocular diseases such as diabetic retinopathy, age-related macular degeneration (ARMD), glaucoma, and autoimmune uveitis. Notably, vitamin and mineral deficiencies, including vitamin A and zinc, essential for retinal health, are influenced by gastrointestinal absorption capacity, thus reaffirming the Ayurvedic notion of digestive health being foundational to ocular vitality.

Furthermore, the pathogenesis of ocular degeneration in *Ayurveda*, traced through the depletion of *rasa dhatu* and disruption in the transformation of successive *dhatus*, aligns conceptually with the modern understanding of neurodegenerative changes and retinal microvascular impairment due to chronic inflammation and metabolic stress. The ancient description of *rupavaha sira dushti* and *sthana samsraya* of *doshas* in ocular tissues is echoed in modern mechanisms involving the breakdown of the blood-retinal barrier and retinal ganglion cell apoptosis.

This integrative exploration supports the hypothesis that preserving digestive and metabolic balance, as emphasized in *Ayurveda* classics, can play a preventive and therapeutic role in mitigating the onset and progression of visual impairment. Strategies such as *pathya ahara-vihara, rasayana* therapy, and *netra kriyakalpa* offer a framework for holistic intervention that complements modern pharmacological and surgical management of eye diseases. Also the future of ophthalmology may very well include focus on the gut as a means to prevent and treat disease.

To prevent such disorders, *Ayurveda* suggests simple lifestyle measures for everyone:

- ***Ahara Vidhi*** (dietary discipline): Consume fresh, warm, light, and easily digestible meals in proper quantity. Avoid incompatible combinations, heavy, fermented, and junk foods that create *aam*.
    - ***Dinacharya*** (daily regimen): Begin the day with lukewarm water, practice oil pulling, body massage, and regular exercise to support digestion, metabolism, and eye health.
    - ***Nidra*** (adequate sleep): Proper and timely rest maintains balance of *vata* and *pitta*, essential for ocular well-being.
    - ***Netrakriyakalpa*** (eye care): Practices like collyrium, medicated ghee retention, and eye drops strengthen and protect vision.
    - ***Pathya for Netraroga***: Include ghee, milk, leafy greens, *Triphala,* and vitamin A–rich foods to nourish the eyes.
    - **Avoid *Apathyas***: Refrain from alcohol, smoking, irregular meals, suppression of natural urges, late nights, and prolonged screen use, as these aggravate *vata* and *pitta*.
    - ***Ritucharya*** (seasonal regimen): Adapting diet and habits to seasonal changes preserves digestive fire and prevents *srotodushti*.

CONCLUSION:

In conclusion, the review reaffirms the central role of *annavaha srotas* and *agni* in the *Ayurvedic* pathophysiology of blindness and ocular disorders. It underscores the relevance of these concepts in light of contemporary research on gut microbiota and systemic disease. The convergence of traditional Ayurvedic wisdom with modern scientific insights opens avenues for a multidimensional, integrative approach to ocular health, one that emphasizes digestive integrity, metabolic harmony, and targeted ocular therapy.

Future directions may include clinical research bridging Ayurvedic diagnostics and gut microbiome profiling, and evaluating the efficacy of *Ayurvedic* interventions in conjunction with modern therapies. Such integrative methodologies hold promise for more comprehensive strategies in blindness prevention, early intervention, and ocular disease management, ultimately improving patient outcomes and quality of life.

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