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Review Article

OCULAR MANIFESTATIONS OF SYSTEMIC DISEASES: AN AYURVEDIC PERSPECTIVE

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ABSTRACT

Eye is an indicator of both health and disease. Ocular manifestations are so common in many systemic diseases and occasionally eye findings may be the first indicator of underlying systemic disease leading to diagnosis. No medical examination is really thorough or complete without examination of eye. The present article makes an attempt to critically analyze ocular signs and symptoms of systemic diseases and their management in *Ayurvedic* perspective. Authoritative treatises of *Ayurveda*, clinical medicine texts & related websites were reviewed for this purpose. Specific ocular manifestations may help in diagnosis of infectious and non-infectious diseases even at the prodromal stage itself. Review of literature reveals that *Agni* (Digestion and Metabolism), *Apanavayu* (*Vayu* responsible for functions such as defaecation, urination etc.) and *Yakrit* (Liver) are the main contributing factors of normal physiology and pathology of eye. It is also evident that normalization of *Agni* and *Apanavayu* and maintenance of Liver health play the key role in the maintenance of eye health. It can be concluded that examination of eye is the important part of general examination and may provide clue regarding hidden pathology many a times.

KEY WORDS : Apanavayu, Drishti vadha, Ocular manifestations, Timira, Yakrit

INTRODUCTION

Eye is a mirror that reflects the health of a person and is intimately linked with the rest of the body in many ways, such as by origin, blood supply and continuity of the nerve fibres and meninges with the brain. It is therefore to be expected that the eyes would reflect changes within the body, especially vascular changes in the smaller vessels¹. An old English proverb originating from a passage in the Bible [Matthew 6:22-23] states, “ The eyes are the windows to the soul”. Ocular manifestations are common in many systemic diseases and occasionally eye findings may be the first indication of underlying systemic disease leading to diagnosis. No medical examination is really thorough or complete without examination of the eye. Though *Yogaratanakara* describes *Ashtasthana Pareeksha* (Examination of eight vital points) as an important examination tool, but among them the author reiterates the necessity of examination of *Nadi* (Pulse), *Jihva* (Tongue), *Akshi* (Eye), and *Mutra* (Urine) before starting treatment². Similarly, as per modern concept, ophthalmoscope is an essential part of the examination kit of every medical practitioner and all general physicians should be competent enough to perform fundus examination.

Eye is an organ which reflects *Prakriti* (Physical Constitution) of a person merely through its appearance. Rough, lusterless, round, unpleasant eyes which resemble those of the dead, and lids kept open while sleeping are the characteristics of *Vata Prakriti*, while *Pitta Prakriti* persons are having brown, unsteady eyes desiring cold comfort with thin and few eyelashes, becoming red very quickly by anger, drinking wine

and exposure to sunlight. *Kapha Prakriti* eyes are red at the angles, unctuous, long, wide, with well designed sclera and cornea and with more eyelashes³. Eye is an indicator of different stages of diseases too. *Purvarupa* (Prodromal stage), *Doshaja* (*Vataja*, *Pittaja*, *Kaphaja*), *Sama* (Inflammatory), *Nirama* (Non - Inflammatory) stages of diseases present with specific ocular manifestations, which are the key points in the diagnosis of many systemic illnesses. The present article makes an attempt to critically analyze ocular signs and symptoms of systemic diseases and their management in *Ayurvedic* perspective. *Ayurvedic* classics, compendia, clinical medicine texts & related websites were consulted and reviewed for the present work.

EYE- ORIGIN, ANATOMY AND PHYSIOLOGY

All Sense Organs are said to have their embryological origin from *Atmaja Bhava*⁴ (Features developing from soul). Like each and every cell of the body, eye is having specific *Panchabhoutik* (Five basic elements) composition. *Acharya Susruta* opines that in eye-ball, muscular, vascular, corneal, scleral and lacrimal passages originate from *Pruthvi* (Earth), *Agni* (Fire), *Vayu* (Air), *Ap* (Water) and *Akasa* (Space) *bhutas* respectively⁵. *Pranavayu* supports all Sense Organs. Movements of eyelids is controlled by *Vyanavayu*⁶. Though there was no direct reference about the relation between eye and *Apana*, majority of the ophthalmic patients experience Vitiating of *Apanavayu*. Vision is one of the main attributes of *Pitta*; esp. that of *Alochakapitta*. *Tharpaka kapha* located in head helps in the nourishment of Sense Organs⁷. Location of eye in Head makes it easily prone to vitiating of *Kapha*⁸.

OCULAR MANIFESTATIONS OF SYSTEMIC DISEASES AS PER AYURVEDIC CLASSICS

After reviewing *Ayurvedic* literature, 25 major diseases were found to have ocular manifestations at different stages of their development^{9,10}.

Table 1: Ocular signs as per *Ayurvedic* Classics

<i>Jvara</i> (Pyrexia)	<i>Purvarupa</i>	Tired eyes full of tears, Burning eyes
	<i>Kapha vataja</i>	Blurring of vision
<i>Raktapitta</i> (Haemorrhagic disorders)	<i>Sannipataja</i>	Dirty, reddish, irregular eyes full of tears, eyelashes sticking together
	<i>Purvarupa</i>	Red, yellow, greenish eyes
<i>Kasa</i> (Cough)	<i>Urdhvaga</i>	Bleeding through eyes
	<i>Pittaja</i>	Yellowish eyes, gazing at stars due to continuous cough
<i>Swasa</i> (Dyspnoea)	<i>Kshayaja</i>	Glittering eyes
	<i>Tamaka</i>	Wide open eyes, upward gaze
	<i>Chinna</i>	Downward gaze, unsteady eyes full of tears, one eye is red in colour
	<i>Mahan</i>	Unsteady eyes
<i>Hikka</i> (Hiccough)	<i>Urdhva</i>	Upward gaze, rolling eye balls and terrific look
	<i>Yamala</i>	Unsteady eyes
	<i>Mahati</i>	Red eyes full of tears
<i>Rajayakshama</i> (Tuberculosis)	<i>Purvarupa</i>	Whitish eyes
<i>Hridroga</i> (Cardiac diseases)	<i>Krimija</i>	Blackish eyes
<i>Trishna</i> (Water and electrolyte imbalance)	<i>Raktaja</i>	Reddish eyes
<i>Madatyaya</i> (Alcoholism)	<i>Pittaja</i>	Reddish eyes
<i>Madam</i> (Disturbance of consciousness)	<i>Raktaja</i>	Fixed gaze
<i>Arsha</i> (Haemorrhoids)	<i>Purvarupa</i>	Edema of eyes
<i>Arsha, Udavartha, Vatika Grahani</i> (GIT disorders)		Blurring of vision
<i>Pandu</i> (Anaemia)	<i>Rupa</i> (Symptom)	Periorbital oedema
	<i>Vataja</i>	Dry reddish and blackish eyes
	<i>Pittaja</i>	Yellowish eyes
	<i>Kaphaja</i>	Pale eyes
<i>Kamala</i> (Jaundice)	<i>Rupa</i>	Yellowish eyes
<i>Udara</i> (Ascites)	<i>Vataja</i>	Reddish and blackish eyes
	<i>Pittaja</i>	Yellowish eyes
	<i>Kaphaja</i>	Pale eyes
	<i>Purvarupa</i>	Yellowish eyes
<i>Prameha</i> (Diabetes Meliitus)	<i>Purvarupa</i>	Yellowish eyes
<i>Kushta</i> (Skin diseases)	<i>Asthi majjastha</i>	Pale eyes
<i>Unmada</i> (Psychiatric disorders)	<i>Vataja</i>	Protuberant reddish eyes
	<i>Pittaja</i>	Visual hallucinations
	<i>Vishaja</i> (Poisonous)	Reddish eye
	<i>Purvarupa</i>	Distortion of eye ball, blurring of vision
<i>Apasmara</i> (Epilepsy)	<i>Rupa</i>	Visual hallucinations
	<i>Vataja</i>	Reddish dry eyes, black outs
	<i>Pittaja</i>	Visual hallucinations
	<i>Kaphaja</i>	Pale eyes
<i>Vatavyadhi</i> (Neurological disorders)	<i>Indriyagatha vata</i> (Vata vitiated over sense organs)	Derangement of sense organs
<i>Apatantraka</i> (Convulsive disorders)		Open eyes with fixed gaze
<i>Antharayama</i> (Tetanus/Ophisthotonus)		Ophthalmoplegia
<i>Arditha</i> (Facial palsy)		Ophthalmoplegia, One eye is kept open

Analysis of above information indicates that diseases affecting 13 *srota* (body channels) are presenting with ocular signs. *Jvara*, *Pandu*, *Hridroga*, *Trishna* are the main diseases of *Rasavaha srota* (Vascular and lymphatic system), having ocular signs. Specific prodromal symptom of *Pittaja jwara* is burning eyes, which implies that any *Pitta* predominant disease may produce burning eyes in their prodromal stage. While coming to *Pranavaha srota* (Respiratory system), *Kasa*, *Swasa*, *Hidhma*, *Udara* present with ocular signs and symptoms. *Shwasa* and *Hikka* are the diseases which are known as “*Mrutyukaale krutaalayou*” (Monitory signs of death). *Chinna shwasa*, *Maha shwasa*, *Urdhva Shwasa*, *Yamala Hikka* and *Maha Hikka* are usually experienced by patients approaching to death. In such cases, alterations in the colour, shape and movements of eye can be taken as warning signs of impending death. Diseases affecting *Manovaha* (Mind) and *Sanjavaha srota* (Nervous system) like *Mada*, *Madatyaya*, *Unmada*, *Apasmara* are presenting with distortion of shape and movements of eyes and

visual hallucinations. Upward rolling of eye balls is an important symptom of epileptic aura.

Vatavyadhi is mainly considered as the disorder of *Asthi Majja vaha srota* (Nervous and Musculo-skeletal system). Among *Vatavyadhi*, *Indriyagata vata*, *Apatantraka*, *Antharayama*, *Ardita* may present with specific diagnostic ocular manifestations. It is also mentioned that, abnormal increase of *Majja dhatu* produces *Netra gourava*¹¹ (heaviness of eyes) and abnormal decrease of *Majja dhatu* produces *Timiradarshana*¹² (Blurring of vision). Moreover, *Akshisneha* (Unctuous substance in the eye) is considered as the waste product of *Majjadhatu*¹³. Pale eyes and Yellowish sclera alone are sufficient to diagnose *Pandu* and *Kamala* respectively. *Rajayakshma* and *Prameha*, which are affecting *Tridosha* (Three body humors), *Saptadhatu* (Seven body tissues), *Malas* (Waste products) and 13 *srota* are showing ocular signs from the very beginning of its pathogenesis ie. in the prodromal stage itself. Like *Prameha*,

other metabolic diseases like Dyslipidaemia, fatty liver etc. also produce *Netra upadeha* (Coating of eyes). In addition, Dhoomara¹⁴ and Timiraabhaasa¹⁵ are the *Drishitigata rogas* (Ophthalmic diseases) which are mentioned to have systemic origin.

Table 2: Drishitigata rogas having systemic origin

Diseases	Cause	Symptom
<i>Dhoomara</i>	Grief, Fever, Headache	Dirty dusky eyes
<i>Timiraabhaasa</i>	Mental stress, Physical trauma, Improper sitting style, Complications of Panchakarma	Pseudo visual blurring

OCULAR FEATURES OF SYSTEMIC DISEASES AS PER MODERN MEDICINE

Nutritional deficiencies, viral, bacterial, parasitic and fungal infections, skin and mucous membrane diseases, endocrinal, metabolic and haematological disorders are presenting with specific ocular signs at different stages¹⁶. Correction of the underlying pathology should be the principle to be followed in the management of these kinds of diseases.

Table 3: Nutritional deficiencies

Vitamin A	Xerophthalmia
Vitamin B ₁ (Thiamine)	Corneal Anaesthesia Conjunctival & Corneal dystrophy Acute retrobulbar neuritis
Vitamin B ₂ (Riboflavin)	Photophobia, burning sensation
Vitamin C	Haemorrhages in conjunctiva, lids, anterior chamber, retina and orbit
Vitamin D	Zonular cataract, Papilloedema, Increased lacrimation

Deficiency of Vitamin A and B₁ produce *Vatika* symptoms like dryness, anaesthesia and atrophy of different structures of eye. Vitamin B₂, Vitamin C and Vitamin D produces *Pittaja*, *Raktaja* and *Kaphaja* symptoms respectively. Further analysis of nutritional deficiency reveals that in such conditions, pathology lies at the level of *Agni* (Digestive fire), ie. at *Jataragni*, *Dhatvagni* or *Bhutagni*, which interferes with digestion, absorption and assimilation of nutrients. This results in deficiency of micro and macro nutrients. Therefore, *Agnideepana* (Stimulation of digestive fire) and *Santarpana* (Nourishing therapy) can yield better results in the management of these types of diseases

Table 4: Systemic infections

Viral	
Measles	Catarrhal conjunctivitis, Corneal ulceration, Optic Neuritis, Retinitis
Mumps	Conjunctivitis, keratitis, Acute dacryoadenitis, Uveitis
Rubella	Congenital microphthalmos, Cataract, Glaucoma
Whooping Cough	Subconjunctival haemorrhage, Proptosis
AIDS	Retinal microvasculopathy, Ocular infections, fungal corneal ulcers, Neoplasms, Cranial nerve palsies, Blindness
Bacterial	
Septicaemia	Metastatic retinitis, uveitis or endophthalmitis
Diphtheria	Membranous conjunctivitis, Corneal ulceration, Paralysis of accommodation and extra-ocular muscles
Typhoid	Lagophthalmos, Optic neuritis, Corneal ulceration
Tuberculosis	Granulomatous conjunctivitis, Interstitial keratitis, Uveitis, Papilloedema
Syphilis	Primary – Conjunctivitis, Chancre of conjunctiva. Secondary- Iridocyclitis. Tertiary – Choreoretinitis, Gummata in the orbit Neurosyphilis – Optic atrophy & pupillary abnormalities
Leprosy	Cutaneous nodules on eyelids, madarosis, interstitial keratitis, exposure keratitis, dacryocystitis
Parasitic	
<i>Taenia echinococcus</i>	Hydatid cyst of orbit, vitreous, retina
<i>Taenia solium</i>	Cysticercus cysts of conjunctiva, vitreous, retina, orbit, extra-ocular muscles
Onchocerciasis	Sclerosing keratitis, Uveitis, Choreoretinitis, Optic neuritis, Optic atrophy, Blindness
Fungal	Mycotic corneal ulceration, fungal endophthalmitis, fungal infections of orbit

On analyzing viral, bacterial, parasitic and fungal infections, it can be inferred that first stage of infections is predominated by *Pitta Kaphaja* symptoms like conjunctivitis, uveitis, keratitis etc. In the second stage, *Rakta* gets involved and produces haemorrhages and ulcers. Finally *Vata* comes into the picture and produces serious sequelae like cataract, glaucoma, optic nerve atrophy, cranial nerve palsies etc. All these reduce the quality of vision and finally ends up with blindness. Pathogenesis can be arrested in the initial stage with treatment modalities giving due importance to *Shodhana* (Elimination therapy), *Kapha Pitta Shamana* (Pacification) and *Rakta Prasadana* (Blood purification). When complications develop, they should be managed accordingly on priority basis.

Table 5: Skin and Mucous membrane diseases

Atopic Dermatitis	Conjunctivitis, Keratoconus, cataract
Rosacea	Blepharitis, Conjunctivitis, keratitis, Rosacea pannus
Dermatitis herpetiformis	Recurrent bullae, ulceration, cicatrization
Epidermolysis Bullosa	Cicatrizing conjunctivitis, Keratitis
Stevens – Johnson Syndrome	Conjunctival ulceration, Ocular pemphigoid

Constituents involved in the pathogenesis of Skin and Mucous membrane diseases are *Pitta*, *Kapha*, *Rasa*, *Rakta* and *Mamsa*. Pathogenesis of these diseases simulates *Kushta* and *Visarpa* (Eczema). They can be managed in the same way as that of infections; giving more stress to purificatory therapy ie. *Vireka* (Purging) and *Raktamoksha* (Blood letting).

Table 6: Endocrinal and Metabolic Disorders

Gout	Episcleritis, Scleritis, Uveitis
Diabetes Mellitus	Lids – Xanthelasma, Recurrent stye Conjunctiva – Telangiectasia, Sub – conjunctival haemorrhage Cornea - Decreased corneal sensations, Infective corneal ulcers, delayed epithelial healing Iris – Neovascularisation Lens – Cataract Vitreous Humor – Vitreous haemorrhage, Fibro vascular proliferation Retina – Diabetic retinopathy Intra-ocular pressure – Glaucoma Optic nerve – Optic neuritis Extra – ocular muscles – Ophthalmoplegia Refractive errors – Hypermetropia, Myopia
Dyslipidaemia	Arcus Senilis
Galactosemia	Congenital cataract
Homocystinuria	Bilateral subluxation of lens
Mucopolysaccharidosis	Corneal opacification, Pigmentary retinopathy, Glaucoma, Optic atrophy
Hyperthyroidism	Thyroid ophthalmopathy, Superior limbic keratoconjunctivitis, Optic disc edema, Exophthalmosis
Hypoparathyroidism	Fasciculation, Cataract, Optic disc edema
Wilson's disease	Kayser – Fleischer Ring, Sun – flower cataract

Diabetes Mellitus occupies the topmost position in the causation of ocular manifestations, not sparing even a single structure of eye. Manifestations ranging from lid to retina, producing styes, ulcers, haemorrhages, cataract, glaucoma, refractive errors, retinopathy etc.

Table 6: Hematological diseases

Anaemia	Retinopathy
Lukaemia	Proptosis, Retinopathy
Sickle cell disease	Dilated conjunctival vessels, Retinopathy
Lymphoma	Lid and orbital deposits, Uveitis

All the metabolic, endocrinal and haematological disorders can be grouped under disorders of *Annavaha* (Gastro- intestinal system) and *Raktavaha srota* (Blood and Circulatory channels). Several systemic diseases like *Jvara*, *Raktapitta*, *Rajayakshma*, *Prameha*, *Arsha* etc. produce ocular manifestations in their prodromal stages itself. This substantiates the importance of eye examination in clinical diagnosis. *Jvara*, *Raktapitta*, *Arsha*, *Gulma*, *Udararoga*, *Pandu* show specific signs in eyes according to *Doshakopa*. *Vata*, *Pitta* and *Kapha dosha* produce dry blackish red eyes; yellowish or greenish tint and pale eyes respectively. All these are diseases of *Raktavaha* or *Annavaha Srotas*, which involve *Yakrit* (Liver) as *Mulasthan* (Origin) or *Koshtanga*(Organ).

Eye is *Tejomaya* (Agni predominant), similarly *Yakrit* is also *Tejomaya*. *Yakrit* is the seat of *Jataragni* and *Bhutagni*. According to Traditional Chinese Medicine(TCM), liver blood is believed to nourish and moisten the eyes and diseases involving the eyes are closely related to liver imbalance. There are ocular changes associated with a wide spectrum of congenital, familial and acquired liver disorders. Scleral icterus is a sign of liver damage. Xanthelasma Palpebra are tiny yellow bumps on the eyelids. Because high cholesterol frequently accompanies fat accumulation in the liver, Xanthelasma Palpebra could be a warning of the easily missed, very common, and potentially dangerous condition known as Fatty Liver disease. Since a healthy liver typically benefits the eyes, antioxidants are typically advised to support the health of both liver and eyes. Diet and drug promoting liver health will support eye health.

Suppression of natural urges like flatus, Feces and Urine produce Loss of Vision¹⁷. Similarly one of the main symptom of diseases due to *Apana* vitiation like *Arsha*, *Udavarta* and *Vatika Grahani* is *Timira*(Blurring of Vision). Vitiation of *Apana* can

be considered as one of the main cause of eye diseases and therefore *anulomana*(Normalisation) of *Apanavayu* is very important for maintaining eye health.

Although eye diseases are considered as *Langhaneeya* (Suitable for thinning therapy), excessive emaciation is also responsible for *Drik kshaya* (Abnormalities of Vision)¹⁸. Therefore, all types of metabolic and endocrinal disorders may have a component in eye diseases too. Correction of *Agni* through *Langhana*(Thinning therapy) is the first step of management of ocular manifestations arising from metabolic and endocrinal disorders. *Sthanika chikitsa*(Local therapy) can be done after attaining *Agnideepti* (Proper digestive fire) and *Nirama avasta* (Relieving inflammation).

CONCLUSION

In view of the above facts, it is very clear that most of the *Srota* and *Rogamarga* pathologies including *Ashtamahagada*(Eight potentially serious illnesses) are particularly having specific diagnostic ocular manifestations. Normalization of *Agni* and *Apanavayu* and maintenance of health of *Yakrit* are the key factors for maintenance of eye health. So never miss the eye, then you will never miss the diagnosis.

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