WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
Coden USA: WJPRAP Impact Factor 8.63
Volume 15, Issue 22, 151-159. Review Article ISSN 2277–7105

SHALAKYA TANTRA AND NEURO-OPTHALMOLOGY: AN INTEGRATIVE REVIEW

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Article Received on 17 Oct. 2026,
Article Revised on 07 Nov. 2026,
Article Published on 16 Nov. 2026

https://doi.org/10.5281/zenodo.24271858

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How to cite this Article: [1]*Sudipana Sarkar, [2]S. K. Hafiz Hasan. (2026). Shalakya Tantra and Neuro-Opthalmology: An Integrative Review. World Journal of Pharmaceutical Research, 15(22), 151–159.

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ABSTRACT

Background: The term “Shalakya” originates from Shalaka, referring to the instruments used in diagnostic and therapeutic procedures. Classical texts describe this branch extensively, particularly through the contributions of Acharya Sushruta, who detailed surgical techniques and anatomical understanding of sensory organs. Acharya Susruta mentioned twelve Dristigata rogas and Acarya Vagbhata also described twenty seven Dristigata rogas. Trimira is one of them. Trimira defined as the gradual loss of visual clarity, progressing from blurry vision to permanent blindness if untreated. Neuro-ophthalmology is deals with visual disorders related to the nervous system. It focuses on diseases affecting the optic nerve, visual pathways, and brain centers responsible for vision. So an ameliorative optimal strategy was taken to review the ancient Indian system of medicine described visual impairment with modern medicine Neuro- ophthalmological disorder. Materials and Method- an ameliorative review done from Ayurveda classics, Modern text with relevant research articles. **Conclusion:** ancient Indian system of medicine specialized brunch Shalakya Tantra gives an early precursor to ophthalmology (Eye) and otorhinolaryngology (ENT), emphasizing both preventive and curative care.

KEYWORDS: Timira, Drishti Nasha, Myopia, Neuro-Ophthalmological Disorders, Visual

Impairment.

INTRODUCTION

A global society built on the ability to see, vision plays a critical role in every facet and stage of life. Vision is the most dominant of the five senses and plays a crucial role in every facet of our lives. The ancient Indian system of medicine- Ayurveda, embraces eight clinical branches comprehensively known as Ashtanga Ayurveda. Among them, Shalakya Tantra—also known as "Urdhvanga Chikitsa"—deals with diseases located above the clavicle. The term "Shalakya" originates from Shalaka, referring to the instruments used in diagnostic and therapeutic procedures. Classical texts describe this branch extensively, particularly through the contributions of Acharya Sushruta, who detailed surgical techniques and anatomical understanding of sensory organs. In Modern contemporary science identifies Shalakya Tantra as an early precursor to ophthalmology(Eye) and otorhinolaryngology (ENT), emphasizing both preventive and curative care. Ancient scholars classified numerous diseases Spectrum, Clinical Scope and Therapeutic Modalities under Netraroga (Neuro- ophthalmological disorders) as Timira, drishti nasha, ardita, Arma (correlated with pterygium) etc.

In Ayurvedic physiology, the netra(eye) is governed strongly by the alochaka Pitta and connected with Vata and Kapha via ocular and cranial channels. Disturbance of any of the aforesaid three doṣas, accumulation of ama, obstruction of srotas, and impaired nutrition of ocular tissues lead to a wide spectrum of eye diseases—ranging from timira (loss of vision) drishti nasha and abhishyanda (conjunctivitis) to more complex disorders such as glaucoma, retinal degeneration and optic neuropathy. Neuro-ophthalmology is a specialized branch of Clinical medicine that deals with visual disorders related to the nervous system. It focuses on diseases affecting the optic nerve, visual pathways, and brain centers responsible for vision.[1] According to WHO globally, at least 2.2 billion people have a vision impairment, of whom at least 01 billion have a Neuro- ophthalmological vision impairment that could have been prevented or has yet to be addressed. Tens of millions have severe vision impairment and could benefit from rehabilitation which they are not currently receiving. The burden of eye conditions and vision impairment is not borne equally: it is often far greater in low- and middle-income countries, among older people and in women, and in rural and disadvantaged communities., An "Universal eye health: a global action plan 2014–2019", was called for universal access to comprehensive eye care services and set an ambitious global target to

reduce "prevalence of avoidable Neuro- ophthalmological visual impairment by 25% by 2019.[2]

So an ameliorative optimal strategy was taken to review the ancient Indian system of medicine described visual impairment with modern medicine Neuro- ophthalmological disorder.

AIM AND OBJECTIVE

A critical review done on Shalakya Tantra diseases Spectrum, Clinical Scope and Therapeutic Modalities with special reference to Neuro- ophthalmological disorders.

MATERIALS AND METHOD

Literary review done from Ayurveda classics, Modern text with relevant research articles, Research works, related web page and online databases like- PubMed, Scopus, DHARA, and Google Scholar.

DISCUSSION

Visual system, Pathways and vision functions WSR Netra-drishti: The visual system encompasses the eyes, optic nerves, and pathways to and between different structures in the brain. Structures at the front of the eye (the cornea and lens) focus light entering the eye onto the retina. In the retina, light is converted into nerve impulses which travel through the optic nerves and pathways to a specific part of the brain known as the visual cortex. These impulses are then transmitted to many other parts of the brain where they integrate with other inputs (such as from hearing or memory) to enable a person to understand the surrounding environment and respond accordingly. The visual system enables the vision functions which support a variety of activities and occupations. Visual acuity is the ability to see details clearly, regardless of the distance of the object. Distance visual acuity is used in many everyday situations, such as reading a blackboard, signposts or bus numbers, or when recognizing people across a room. It is important for many occupations and recreational activities, such as playing sports. Colour vision has a very practical role, allowing differentiation of objects of a similar size and shape, such as medication; it is also important for occupations such as electrical work, aviation and fashion. Stereopsis or binocular vision (depth perception) allows judgement of distances and the speed of approaching objects.

Netra-drishti or Drishti is the most tendentious term of Shalakya Tantra explained in Sushruta Samhita. Sushruta Samhita describes Rachana Sharir of Netra (anatomy of eye) as a layered entity, with five separate levels of "Mandala" (Vartma, Pakshma, Shweta, Krishna, and Drishti Mandala) each contributing to specific eye functions.[3] Eye has six junctions called sandhis[4] that allow these layers to communicate with each other (Pakshma-Vartamagata Sandhi, Vartama-Shuklagata Sandhi, Shukla-Krishnagata Sandhi, Krishna-Drishtigata Sandhi, Kaninaka Sandhi and Apanga Sandhi). Eye also has six thin membranes called patalas that are essential for the eye's refractive abilities. Drishti is made up of Panchamahabhoot, but Teja mahabhoot is predominant in the form of Alochaka Pitta which is considered as light media for the eyes. Alochaka Pitta, a subtype of Pitta Dosha responsible for visual perception. Ancient r Ayurvedic literature states that Alochaka Pitta enables the eye to perceive visual objects and their characteristics.[5] The Netra serves as a physical organ, while Alochaka Pitta represents the functional principle responsible for perception. This concept can be correlated with visual pathways.

Early stage visual disorders WSR Trimira & Drishti Nasha

Timira has been mentioned in Uttartantra. According to Amarakosa, the meaning of Timira is darkness. Acharya Susruta mentioned twelve Dristigata rogas and Acarya Vagbhata also described twenty seven Dristigata rogas. Trimira is one of them. Trimira defined as the gradual loss of visual clarity, progressing from blurry vision to permanent blindness if untreated. Timira is foisting four Patala causing Prathama, Dwitiya, Tṛtiya and Caturtha Patalagata Timira. Timira is classified base on dosa etiology into six types i.e. Vataja, Pittaja, Kaphaja, Raktaja, Sannipataja and Parimalayi[6], The Prathama Patala can be correlate as Cornea and aqueous humor as they are the seat of Tejas and Jala. Dwitiya Patalas, which is Mamsasrita, can be taken as Iris and Ciliary body; they are mesodermal in origin and contain muscles tissue. Tṛtiya Patala can be considering as lens and vitreous humour; which resembles Medas. If untreated it involve in Caturtha Patala and leads towards drishti nasha. Due to Nidanasevana there is vitiation of Doshas(pitta-vata) which leads to the the symptoms of Prathama Patalagata Timira. Vitiated Dosa reach to the internal orbital organs through Sira and occupies Prathama Patala followed by Dwitiya, Tṛtiya and Caturtha Patala. Acarya Vagabhat described Clinical feature of the Prathama Patalagata Timira is blurred vision without any reason. This Clinical feature is quite similar to myopia. The World Health Organization estimates that by 2050, nearly half of the world's population will be myopic. Myopia or short-sightedness usually affects children and adolescents progressing up to age 16

or more. Myopia is becoming more common problem in general population various surveys in India have found the Prevalence of myopia ranging from 6.9% to 19.7%. An estimate of number of people suffering from refractive errors in the world is in range of 8 million to 2.5 billion. According to WHO, 43% of vision impairment is due to uncorrected refractive errors.[7] Myopia is a condition where parallel rays of light focus in front of the retina when accommodation is relaxed, resulting in blurred distance vision. It can be simple myopia usually <−6.00 diopters, often stabilizes in early adulthood and high Myopia (Pathological), more than −6.00 diopters; may lead to degenerative changes like retinal detachment or macular degeneration. Timira is one such disease, found in the Sushruta Samhita and other Shalakya Tantra classical books, which appears to describe symptoms consistent with refractive errors, such as myopia.

Table 1: Myopia clinical features.[8]

	Signs	**Symptom**	**Complication**
Myopia	I. Prominent eyeballs II. Anterior chamber is slightly deeper than normal III. Somewhat large pupil with a bit of sluggish reaction IV. Fundus is normal (rarely myopic crescent may be seen)	I. Eyes strain and headache develop due to dissociation between convergence and accommodation II. Poor vision for distance (short-sightedness) III. Half shutting of eyes IV. Psychological changes in untreated myopia, such as introvert, studious, little interest in outdoor activity.	I. Retinal tears or retinal detachment II. b. Complicated cataract due to an aberration of lenticular metabolism III. c. Vitreous hemorrhage IV. d. Choroidal hemorrhage and thrombosis are quite common and lead to severe visual loss when involved

Table 2: vision impairment.[9]

Category	**Visual acuity in the better eye**	
	Worse than:	**Equal to or better than:**
Mild vision impairment	6/12	6/18
Moderate vision impairment	6/18	6/60
Severe vision impairment	6/60	3/60
Blindness	3/60	----------
Near vision impairment	N6 or M 0.8 at 40cm	----------

Facial nerve palsy and optic neuropathy WSR Adrita

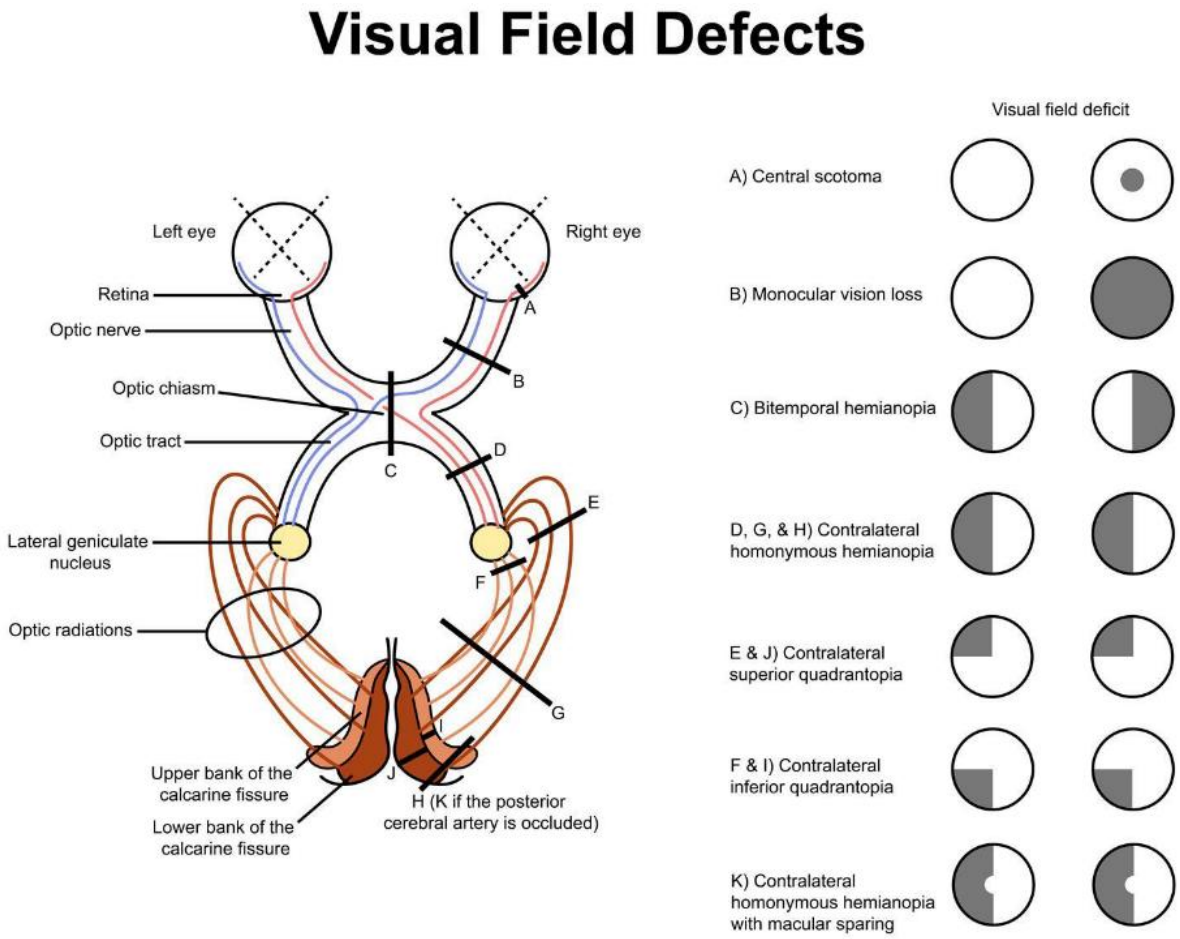
Facial palsy or facial nerve palsy is caused by damage in the facial nerve or impairment in conduction of facial nerve by CNS damage. Facial nerve -2nd brachial arche is contains motor, sensory and parasympathetic nucleus. 70% facial nerve fibers arise from the motor neurons of the facial nucleus and remaining 30% are mixed sensory and autonomic fibers forming nervus- intermedius. Clinical features of facial nerve palsy are hypersensitivity on the affected side, heaviness or numbness of the face, drooping of the corner of mouth, eyebrow droop, loss of sensation forehead and nasolabial folds, uncontrolled tearing, inability to close eye due to lower lid sags and falls away from the conjunctiva, loss of blinking control on affected side, Severe vision impairment on the affected side, altered sense of taste, dribbling of saliva from the angle of the mouth. Optic atrophy or optic neuropathy is a pathological condection referring to optic nerve shrinkage caused by the degeneration of the retinal ganglion cell axons. It is the end stage of a disease process affecting the retinogeniculate portion of the visual pathway, characterized by a nonspecific sign of optic disc pallor. Optic neuropathy chief etiologies are space occupying intracranial lesions (SOL) -26%, congenital -13%, hydrocephalus -12%, Traumatic Optic Neuropathy (TON) 12% and vascular causes 12%.

On the basis of signs and symptoms of Facial nerve palsy and optic neuropathy can be correlated with Adrita. It is a "Nanatmaja Vyadhi". Acharya Charak has explained Ardita as the contracture of mouth along with the involvement of forehead, eyebrow, eye, nasal fold on the affected side of face. Either it is localized in half face with or without involvement of body. Acharya Sushruta has describe the Ardita take place in only face[10]; so it also known as Ekayaam.[11]

Table 2: Ardita symptoms.

	Sushruta[12]	**Charaka**[13]	**Vagbhatta**[14]
Ardita	Vaktrardha Vakrta (half of the face becomes distorted), Grivaapavartanam(neck rotates), Netravikriti(visual deformity of eyes), Griva-Chibuk-Dantanam Parshve Vedana(pain in the side of the neck, chin,	Ardh-mukh-jihmata (distortion of the half of the face), Nasa-Bhru-Akshi-Latata Hanu Vakrata (distortion of the nose, eye, brow, forehead, eye and mandible), Vakrabhojana(ingested food moves tortuously to the one side) , Vaktra Nasika(curved nose),	Vaktrardha vakrta (half of the face becomes distorted), Murdhakampa(shaking of head), Vaksanga(aphasia), Stabdha Netra(eye remain fixed), Dantachala(loose teeth), Swara Bhramsha(hoarseness of the voice), Shrutihani(difficulty in

	teeth), Chala Shiraha (Instability of head), Vaksanga(obstruction of speech)	Stabdha Netra(eye remain fixed), Kshavthu Nigraha(suppression of sneezing), Deenajihwa(speech becomes faint and distorted), Samutkshipta Kala Vak(imperceptible and interrupted speech), Dantachala(loose teeth), Shravanabadhyta(difficulty in hearing), Swrabheda(hoarseness of voice).	hearing), Kshavagraha(suppression of sneezing), Gandhagyana(loss of smell), Smriti Nasha(loss of memory), Moha(delusion), Supti(numbness), Parsvataha Nishthivan(salivation from the side of face), Akshi Nimilana(one eye is closed), Urdhvajatru ruja(pain)



CONCLUSION

Shalakya Tantra remains an important clinical branch of Ayurveda with significant preventive aspect. Eyes get special importance from the time in ancient period. “Sarvendriyanam Nayanam Pradhanam” -it means eyes hold special Status among five sense organs. Expounder Acharya Nimi point of view the subject of Shalakyatantra is presented in

first 26 chapters in Uttar Tantra of Sushruta Samhita wherein 19 chapters hold the Anatomy, physiology, etiology, Pathophysiology of diseases and their treatment, which reflects the importance of ophthalmology since ancient time. Eye is the only organ of the human body whose anatomy, Eye is perhaps the only organ in the body whose anatomy, physiology diseases pathology and their treatment are explained in ancient Indian system of medicine literature. Shalakya Tantra accentuates not just the depth of Indian system of medicine but also the practical implications.

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