SJIF Impact Factor (2024): 8.675| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 9 | Issue: 5 | May 2024 - Peer Reviewed Journal

NYCTALOPIA (NIGHT BLINDNESS)- AN AYURVEDIC PREVIEW

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ABSTRACT
Nyctalopia commonly called as night blindness is a visual symptom characterised by the reduced ability to visualize at night or in dimly lit area. The person may find harder or may take longer time to visualize in dimly lit area. Night blindness is not a disease itself, but instead is a symptom of some inherited ocular disease like retinitis pigmentosa some syndromes like Wagner syndrome ,congenital stationary night blindness etc. Acquired diseases like vitamin A deficiency, corneal opacities, paracentral lenticular opacities and congenital high myopia. The principle pathology involved in night blindness is rod cell dystrophy. In ayurvedic samhitha's also night blindness is mentioned as a lakshana rather as a separate individual vyadhi, under different drishtigata rogas such as kapha vidagdha Drishti, nakulandhya, doshandhya,rathrandhya, nakthandhya, ushna vidagdha Drishti, hriswa jadya by different acharyas. The pathology involved in all the above mentioned disease is different but have night blindness as common symptom.

INTRODUCTION

Rods are the photoreceptors cells present in second layer of retina. They are insensitive to light.(1) There are approximately 90 million rod cell situated in retina, densely concentrated 15 to 20 degree from the fovea. Rods helps in peripheral vision and dim light vision (Scotopic vision) and peripheral vision.(2)

Photosensitive component of rods- in rods, rhodopsin is formed of opsin protein (scotopsin) and retinal(retinene 1- aldehyde of vit A)=visual purple. Rhodopsin of rods most strongly absorb green-blue light, therefore appears reddish purple. When rhodopsin is in its inactive form, which is 11-cisretinal, it will increase the rods activity with light so that's why the rods are highly sensitive to light. Exposure to light allows isomerisation of retinol into its active all-trans-retinal conformation.*(3)*

NYCTALOPIA (NIGHT BLINDNESS)

It can be congenital or acquired symptom of eye.

- **Acquired causes** like vitamin A deficiency, corneal opacities, paracentral/nuclear lenticular opacities, liver diseases.
- **Congenita**l- CSNB (congenital stationary night blindness), congenital high myopia**,** gyrate atrophy.
- **Inherited** cause like retinitis pigmentosa,

- **Vitamin A Deficiency (Xerophthalmia)-** Vitamin A is the biochemical precursor to rhodopsin, which is essential to the visual cycle in rod photoreceptors. The earliest clinical manifestation of vit-A deficiency in an individual is difficulty in distinguishing objects at night. According to WHO classification of Xerophthalmia(1982) nyctalopia is said as prime symptom with code XN(4). It is recognized in local with the name such as "kwak moin-chicken blindness" in Cambodia, "buta ayam-chicken eye" in Indonesia (chicken lacks rod receptors and have poor night vision). *(4)*. In night blindness the serum retinol level is usually between 10-20mg/dl. It is also found after exposure to bright sunlight in hot countries amongst patients who are debilitated by malnutrition or prolonged fasting; the condition generally improves rapidly if the eyes are protected and the required nutrition is supplied.it also occur in the diseases of the liver, especially cirrhosis of liver which hampers the absorption of vit-A*(5).*
- **Retinitis Pigmentosa(RP)-** RP is the heterogenous group of retinal disease with common attributes. It is defines as genetically determined, bilaterally, symmetrical, progressive degeneration of retinal photoreceptors, usually involving rods first followed by cones. RP is world- wide in distribution with a reported prevalence of 1 in 3,500. It's the common retinal cause of blindness especially in south India. Nyctalopia is said to be the hallmark of RP due to disruption rod cells.*(6)*
- **Congenital stationary night blindness(CSNB)**- is a autosomal recessive disease. The complete form of CSNB is characterised by non progressive night blindness from birth, subnormal visual acuity, myopia and normal fundus. Children may present with nystagmus and subnormal vision . these patients have a negative ERG (electroretinogram),with no demonstrable scotopic rod mediated ERG b-wave. *(7)*

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- **Nuclear/paracentral lenticular cataract**- an obstruction to light in anterior segment of the eye may lead to impaired travel of light energy to retinal receptors, causing blurriness of vision and formation of glares which make the person difficult to visualize during night time. *(8)*
- **Congenital/pathological Myopia**- is a refractive error pathology which can causes nyctalopia as the ray of light converge in front of the retina. This pathology may accentuated in dim light, manifesting night blindness.*(9)*
- **Sorby pseudo- inflammatory macular dystrophy**- is a rare condition characterised by bilateral vision loss typically in late thirties primarily presented with nyctalopia. *(10)*
- **Concentric annular macular dystrophy**- presents with progressive visual loss and nyctalopia, presentation is in adult life with mild impairment of central vision. Prognosis is good in this condition.*(10)*
- **Gyrate atrophy**- is caused by mutation of gene (OAT) encoadinf ornithine enzyme. Deficiency of the enzyme leads to elevated ornithine levels in plasma, urine, CSF, and aqueous humour. The visual prognosis is generally poor, with legal blindness occurring around the age of 50 from geographic atrophy*(11)*.
- **Choroideremia**- also called tapeto-choroidal dystrophy is a progressive diffuse degeneration of the choroid, RPE and photo receptors. Symptoms include nyctalopia, loss of peripheral vision and at the end central vision is also affected*(12)*.
- **Wagner syndrome (V can related vitreo-retinopathy**)- is a rare condition having low to moderate myopia, key abnormal finding is optically empty vitreous cavity lacking structural elements and support to retina.50% of cases devolope retinal detachment often before age of 15 years*(13).*

DRISHTIGATA ROGAS

Drishti-

- Size – 1/7th of cornea
- Shape- shape of lentil seed
- Composition- all five mahabutha predominant of tejas
- Appearance- like a spark or glow worm
- Nature- Sheetha guna pradhana
- Covering- covered by patalas of eye from outside *(14)*

Therefore Drishti can be a structural and functional unit of eye taking part in visual pathway. They include lens, refractive media, pupil, retina, macula and optic nerve head*(15).* Any pathology involved in these structure will lead to drishtigata rogas.

Sankhya samprapthi

Night blindness is explained as a symptom under different diseases by different acharyas are enlisted below*:*

According to susrutha-12	According to vagbhata-27
Linganasha-6	Linganasha -6 Aupasargika linganasha-2
Pitta vidagdha Drishti	Pittavidagdha Drishti
Kapha vidhagdha Drishti	Dhoshandha
Dhumadarshi	Dhumara
Hraswajaddya	hriswadrishti
Nakulandhya	Nakulandhya
Gambhirika	Timira-6
	Kacha-6
	Ushna vidhagdha Drishti
	Amla vidagdha drishti

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REFERENCE	DRISHTI ROGAS HAVING NIGHT BLINDNESS AS LAKSHANA	DOSHA	SADYASADYATHA
SUSHRUTHA	Kapha vidagdha Drishti	Kapha	Sadhya
	Nakulandhya	Tridosha	Asadhya
VAGBHATA	Doshandhya	Kapha	Sadhya
	Nakulandhya	Tridosha	Yapya
	Ushna vidhgadha Drishti	Tridosha +Raktha	Sadhya
VIDEHA	Hriswajadya	Pitta	Asadhya
	Nakulandhya	Tridosha	Asadya

KAPHA VIDAGDHA DRISHTI

- Dosha- kapha
- Paryaya-
  Sushrutha-Shleshma vidagda drishti
  Vagbhata- doshandha,rathryandha.
  Madhukosha- Nakthandhya

According to sushrutha-

- In kapha vidagda Drishti the kapha dosha affect all the three patalas of Nethra(trishu shtitho alpa pataleshu dosho).
- Patient see all the objects white in colour (shuklani hi manyathe).
- Not able to visualize at night hours as night is predominant of kapha dosha, instead can see at day time because during day hours (diva suryanugruhitha chakshurishyathe) kapha shamana happens by ushna guna of sun(kapaha alpa bhaavath).

According to vagbhata- (doshandhya)

- During rathri kaala due to sheetha guna pradhanyatha kapha vitiates, covers the Drishti mandala and causes person blind during night hours.
- During the morning hours, the sunrays of raising sun causes liquefaction of kapha and the person can visualize clearly*(17).*

HRISWAJADYA

- Dosha-pitta
- Sadyasadyatha- Asadhya

Acharya Videha-

Has quoted that hriswajadya is one among four types of diseases producing night-blindness and its asadhya.

According to sushrutha –

- Acharya says that due to vitiation of pitta dosha patient feels difficulty to visualize during day time(diwaseshu kruchrat) .
- The objects appear smaller than the normal size(hriswani rupani).

According to yogarathnakara (nethrarogadhikara)-

Due to accumulation of dosha in middle of Drishti the person visualizes objects smaller in size and due to reduction in level of vitiated pitta there is improvement in vision at night time.

Note- hraswajadya is mentioned as a type of night blindness according to acharya Videha, where as according to acharya sushrutha , yogarathnakara has just described it as defective vision only during day time*(18).*

NAKULANDHYA

- Dosha- tridosha
- Sadyasadhyatha-
  Sushrutha,Videha -asadhya
  vagbhata-yapya

According to acharya sushrutha-

- Due to vitiation of tridosha in Drishti it make the eye shinning appearance (vidhyotha) like nakula (mangoose)
- And the person visualizes abnormal colours and texture during day time(chithrani roopani dhiwa sa pashyeth).

According to acharya vagbhata-

- The persons eye looks like mongoose eye due to accumulation of doshas
- As nakula(mangoose) the person visualize in day with difficulty and completely loss of vision during night hours.

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Studies have shown that there are only cone cells in mongoose eyes, making its field of vision restricted and also night blindness*(19).*

USHNA VIDHAGDHA DRISHTI

Dosha - Tridosha+ rakta
Sadhyasadhyatha- Sadhya
Cause- Sudden immersion on cold water after being exposed to heat of sun
Symptoms -

- Daha(burning sensation)
- Osha(increased temperature)
- Muddy coloured conjunctiva(malina shuklam)
- Blurred day vison (ahani avila darshana)
- Loss of night vision(rathrou andhyam)*(20).*

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