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PHYSIOLOGICAL CONCEPT OF *ALOCHAK PITTA* IN RELATION TO PHYSIOLOGY OF VISION: A REVIEW

1 Dr. Neha Sajwan, 2 prof. (Dr.) Rajesh Kumar Sharma and 3 Dr. Dinesh Chandra Sharma

1 Post graduate Scholar, 2 Professor and H.O.D. 3 Associate Professor, P.G. Department of Kriya Sharir, Dr. sarvepalli Radhakrishnan Rajasthan Ayurved University, Jodhpur,Rajasthan, India

ABSTRACT

Ayurveda has a special idea known as the *Tridosha* concept. The three main pillars of the human body are known as the *Tridosha* (*Vata*, *Pitta*, and *Kapha*). *Tridosha* regulates the physiological and voluntary functions of bodily motions and helps to keep the body in a balanced and healthy state. *Pitta* is in charge of generating heat, controlling body temperature, and influencing vision. *Pittas* come in five different varieties: *Ranjaka*, *Pachaka*, *Alochaka*, *Sadhaka*, and *Bhrajaka*. "*Alochaka Pitta*" refers to the *Pitta* that governs vision. *Alochaka Pitta's* seat is known as "*Drishti*." This physiology of vision has been defined by Ayurveda using the characteristics of *Vata* and *Pitta*. Rhodopsin, iodopsin, and melanin, the pigments of the retina, stand in for *Alochaka Pitta*. The retina's rods and cones are what enable colour vision, shape perception, and the perception of brilliant images. This review article describes the location, purpose, and contemporary connections between the *Alochak Pitta* and the physiology of vision.

KEYWORDS - *Tridosha*, *Alochaka Pitta*, Rods, Cones, Physiology of Vision.

INTRODUCTION

Alochaka is Sanskrit for "something which aids in seeing" or "that which aids in thinking." The term "*Lochana*," a synonym for "eye," is the foundation of the word "*Alochaka*." *Alochana* thus means "to behold." *Pitta* is the bodily representation of fire or *Agni*. *Pitta* and *Agni* are hence interchangeable. *Pitta* subtypes all end in "*Agni*." *Alochaka Pitta* and *Alochaka Agni* are synonyms. *Alochaka Pitta's* seat is the *Drishti*, or vision. Vision, also known as *Drishti*, is what allows us to see and understand the world around us. This awareness occurs in the eye.

As a result, the seat of *Alochaka Pitta* is the eye. This *Pitta* subtype not only exists in the physiological eye but also supports visual physiology. The *Tejas Mahabhuta* is represented in the body by *Pitta* despite being *Panchabhautic* in composition, in accordance with the norm that all five *Mahabhutas* are present in the body. Each cell in the body contains it in its subtle form (*Sukshma*). But it can also be seen in other body parts in its

gross form (*Sthula*). According to *Acharya Sushruta*, the *Agni*, symbolised by its five sorts, colourizes, digests, vitalizes, illumines, grasps, and regulates temperature, favouring the body by its *Agni* (enzymatic actions)[i]

Pachaka Pitta, Ranjaka Pitta, Sadhaka Pitta, Alochaka Pitta, and *Bhrajaka Pitta* are the five varieties of Pitta. According to *Bhela*, there are two varieties of *Alochaka Pitta*: *Chakshurvaisheshika* and *Buddhirvaisheshika*.[ii] The first two forms of *Alochaka* Pitta describe, respectively, the activity of the optic pathway in the eye and the brain's optic centre.[iii]

Alochaka pitta is divided into two categories by Acharya *Bhela*, namely *Chakshyu Vaisheshika* and *Buddhi Vaisheshika*. *Chakshyu Vaisheshika* is used to see vision, but *Buddhi Vaisheshika* is used to distinguish between objects, judge them against one another, or store information for later use.[iv] The perception of vision is brought about by this *Pitta* after the *Sannikarsa* of *Atma, Manas*, and *Indriyas*. A *Sringataka's* name as an intellectual differentiator is located between the two brows. It notices the minute and extraordinary things produced in the *Atma* and stores the thoughts it receives in the mind.[v] The word '*Pitta'* is a group which contains several substances. When *Pitta* goes out of gear it is addressed as *Dosha*, though in many cases it has been referred to as *Dosha*. The five varieties are named as follows : -

1. *Pachaka*- which digests the digested food.

2. *Ranjaka*- which imparts colour to skin.

3. *Sadhaka*- which helps efforts.

4. *Alochaka*- which helps in vision.

5. *Bhrajaka*- which shines the skin.

The presence of *Alochaka Pitta* in the eye aids in the visualisation of extra-terrestrial objects. *Alochaka Pitta*, which is linked to the soul, mind, and sense organs, causes the perception of vision. A physio-chemical alteration in the protoplasm caused by the presence of light that strikes the retina stimulates the optic nerve terminals. As a result, the visual purple (Rhodopsin) closely resembles how the *Alochaka Pitta* is described.[vi]

FUNCTIONS OF *ALOCHAKA PITTA*

Two areas anticipate that *Alochaka Pitta* will play a significant role. Its component *Chakshur Vaisheshika* Undoubtedly, *Alochaka Pitta* will look. It aids in seeing the objects that are observed. It aids in understanding and recognising numerous objects. The central controls of vision, located in the forward-looking portion of the brain, are the subject of the second component of vision Pitta, which is located between the brows in the space of *Sringhataka*. This facilitates storing the visual information for subsequent retrieval through memory, the creative mind, and fixation.[vii]

VISION IN *AYRUVEDA*

According to *Ayurveda*, the *Vata* and *Pitta* elements are essential to visual physiology. Light (*Prakasha*) possesses *Sookshma Guna*, which causes it to manifest until the retina's photoreceptors cross multiple layers. The *Vata Chala Guna* is in charge of the photochemical activity in the retina. According to the *Vata Chala* Guna, electrons are in the process of developing. The force of development of electrons increases as soon as light strikes them. *Chala Guna* of *Vata* is able to change the cis type of retina because *Ushna* Guna of *Prakasha* and *Pitta* nearby. What are the body's fundamental and supporting units.[viii] Considering various capacities, the retina can be connected to all *Dhatus*, but the visual cycle is distinct likewise *Raktadhatu*. *Raktadhatu* has the aptitude known as *Jeevanam*. *Jeevanam* implies either food or life. Using a plan simply by observing life, achieve its task. Photoreceptors are the primary source of visual information in the retina. cycle. The destruction of these receptors results in visual loss; hence they can be thought of as *Raktadhatu*.[ix]

Electricity has the *Vata Sookshma Guna*. Power can move in a single direction, much like how water flows from a faucet. It cannot immediately change directions without much provocation, similar to how air advances. The *Srotas* are known as *Roopavaha Dhamani*, and the electrical potential created in the light sensors runs through them.[x]

VISION IN MODERN SCIENCE

All the ancient *Acharya* have mentioned *Alochaka pitta* is residing in *drik* (eye). Commentator *Indu* has mentioned the site of *Alochaka pitta* is *Antah Taraka* (Retina) of *Netra*. The function of *Alochaka pitta* is to perception of vision. The retina is the light-sensitive portion of the eye that contains rod and cone cells. Cones are responsible for color vision and rods can detect dim light and are mainly responsible for black and white vision and vision in the dark. Light and dark stimuli stimulate the cones or rods; signals are transmitted first through the successive layers of the retina and finally into optic nerve fibers and the visual area of the cerebral cortex.

There are ten layers in the retina. Light enters the retina from inside the eye after passing through the lens system, the vitreous humour, and the plexiform and nuclear layers. It then travels to the layer of rods and cones on the retina's outer edge after passing via the ganglion cells, plexiform layers, and nuclear layers. The outer segment, inner segment, nucleus, and synaptic body are the four primary functional segments of either a rod or a cone. The outer portion contains the photochemicals that react to light. Rhodopsin is the name of this photochemical in rods, and colour pigments is the common name for it in cones. Color pigments and rhodopsin are both conjugated proteins.[xi]

OPTIC PATHWAY

The initial light enters the retina from inside the eye, travels via the lens system, and then travels through the humour. Photoreceptors, horizontal cells, bipolar cells, amacrine cells, and ganglion cells are some of the many neuronal cell types in the retina. Rod and cone photoreceptors are photoreceptors that send signals to the outer plexiform layer, where they connect with horizontal and bipolar cells. Rods and cones send information to bipolar cells via horizontal cells in the outer plexiform layer.

The rods, cones, and horizontal cells send impulses vertically to the inner plexiform layers where the bipolar cells synapse with ganglion cells and amacrine cells**.** Amacrine cells can transmit signals in two different ways: directly from bipolar cells to ganglion cells, or horizontally from the axons of the bipolar cells to the dendrites of the ganglion cells or other amacrine cells, all inside the inner plexiform layer. The ganglion cell sends the retina's output signal to the brain via the optic nerve. The bipolar cells of the retina are the first-order sensory neurons that convey visual sensation. Their axons have ganglion cell dendrites with rods and cones at their dendrite synapse.

The ganglion cells are second-order sensory neurons. The fibres of the optic nerve are formed by axons that emerge from the ganglion cells. The optic chiasma, when fibres from the nostril of the retina cross to the opposite side and proceed down the opposite optic tract to terminate in the opposite lateral geniculate body, is formed by the union of the right and left optic nerves. The optic tract of the same side receives the fibres from the temporal half of each retina, which exit in the ipsilateral geniculate body. The lateral geniculate body is home to the cell bodies of the third-order sensory neurons. Their optic axons send visual cortex-bound optic radiations.[xii]

We can determine a number of chemical factors based on current medical sciences that are accountable for the same functions based on the functions of *Alochaka pitta*. The neurotransmitters in the pathway of the optic nerve that control them are the chemical factors. *Alochaka pitta* may be used to represent the neurotransmitter responsible for communication in the optic pathway as well as rhodopsin, iodopsin, bathorhodopsin, lumirhodopsin, metarhodopsin-1, and metarhodopsin-2.

The distinct sense of vision is detected by the major visual region (Area 17). Following that, the data is sent to the secondary visual area, which interprets the meaning of a variety of sensory signals including colour, light intensity, line and angle direction, and other components of vision. For a change in behaviour, greater intelligence, and intended motor activity, the association area receives and evaluates the signal from sensory cortices, motor cortices, as well as subcortical regions. A sort of *Alochaka Pitta* called *Buddhi Vaisheshika Pitta* offers knowledge about prior experience and distinguishes objects from one another to compare with past experience. Additionally, it saves the data for later use. When knowledge is being differentiated, compared, or

remembered, *Buddhi Vaisheshika* pitta communicates between the cortical and subcortical structures of the brain at the molecular level. Even after the creation of *Buddhi* and *Smriti*, *Buddhi Visheshika Pitta* continues to serve its purpose. The lower brain centre starts the cerebral cortex's wakefulness and opens its memory store to allow for the development of *Buddhi*. For the high level of interpretative meaning of the sensory data, *Buddhi* and smriti are necessary.

A potential mechanism of cognition and memory is needed for knowledge differentiation, comparison, or memory. Three pathways carry all of the sensory data to the sensory brain. The cerebral cortex has three main basic sensory regions. The three basic sensory areas—primary somatic, primary visual, and primary auditory—are responsible for detecting the distinct sensory data from the peripheral sensory organ. The information is then sent to the secondary sensory regions, which interpret the signal. The meaning of the sensory data is analysed in the secondary sensory areas.

Interpreting an object's shape or texture in one's hand is aided by the secondary somatic region. The perception of colour, light intensity, line and angle directions, among other visual features, is aided by the secondary visual area. The perception of sound tone and tone sequence in auditory signals is aided by the secondary auditory region. The cerebral cortex contains three association areas that simultaneously receive and process signals from various sections of the motor and sensory cortices as well as subcortical structures. The important association areas include -

1. Parieto-occipito-temporal association areas
2. Prefrontal association area
3. Limbic association area.

DISCUSSION

Pitta can be categorised into five different ways*: Ranjaka, Pachaka, Alochaka, Sadhaka*, and *Brajaka*. The *Akshi* is *Alochaka Pitta's Visesha Sthana*.

Rupagrahana is caused by *Alochaka Pitta*. Rhodopsin and iodopsin, two components of the contemporary pigment of the retina, can be closely associated to *Alochaka Pitta* because of their closeness in location and function. Dark vision is caused by rhodopsin, which is created in the layer of rods. Rods are especially sensitive to low light, and they are mostly used for motion detection. The breakdown of rhodopsin into its two parts, opsin and retinine, results in the nerve impulse. Rhodopsin is renewed as retinine is once more converted into vitamin A. Iodopsin is found in cones. Cone layer is where colour and photopic vision, or seeing light, occurs. Melanin is found in the retina's pigment layer. As a result, light rays cannot reflect internally within the eye, creating a dark chamber.

CONCLUSION

The Pitta subtype known as *Alochaka Pitta* is in charge of vision and the mind. We are able to observe, perceive, and analyse things thanks to *Alochaka Pitta*. *Alochaka Pitta's* seat is the *drishti*, or vision. Vision, also known as *drishti*, is what allows us to see and understand the world around us. Due to their resemblance in location and function, the pigments of the retina, rhodopsin and iodopsin, can be closely associated to *Alochaka Pitta* in current science. *Alochaka Pitta* translates electrical impulses into vision that the brain can comprehend and read. It does this by interpreting the visual inputs of light and colour. Information is processed and assimilated. *Alochaka Pitta* is said to control both internal and external eyesight. The functions, types of *Alochaka Pitta* and its modern correlation physiology of vision are described in this review article.

REFERENCES

[i] Prof. G.D. Singhal & Colleagues, Susruta-Samhita Ancient Indian Surgery Part I, Page no.- 128.

[ii] Dr. Chitta Ranjan Das. A textbook of Physiology, Sharira Kriya Vijnan Volume I, Chaukhambha Sanskrit Pratishthan Delhi, Page no. 96

[iii] Prof. Dr. Subhash Ranade, A Textbook of Kriya Sharira, Part I, Chaukhambha Sanskrit Pratishthan Delhi, Page no.-109.

[iv] Verma S, Yadav JR. Shareera Kriya Vigyana. Varanasi: Chaukhamba Orientalia; 2018. p. 100

[v] K.H. Krishnamurthy, Bhela-Samhita, Chaukhambha Visvabharati Varanasi (India), Page no-206.

[vi] Pt. Shiv Sharma, Dosadhatumala Vijnana, Chaukhamba Surbharati Prakashan Varanasi.

[vii] P.V. Sharma, (2006). BhelSamhita English translation by K.H.Krishnamurthy, Sharirsthana, Purusanicayam, Reprint ed,Varanasi; Chaukhambha Bharati Academy; 4:5, p.206

[viii] Acharya JT, (2016). CharakaSamhita by Agnivesa with Ayurveda deepikateeka of Chakrapanidatta,Sutrasthana,Trisothiyaadhy.

[ix] Paradara HSS, (2017).AshtangaHrudaya with Sarvangasundara commentary of Arunadatta and Ayurveda rasayana commentary of Hemadri Reprint ed, Varanasi,Chaukambha Sanskrit Sansthan; 12:15, p.194.

[x] P.V. Sharma, (2006). BhelSamhita English translation by K.H.Krishnamurthy, Sharirsthana, Purusanicayam, Reprint ed,Varanasi; Chaukhambha Bharati Academy; 4:5, p.206

[xi] Hall JE, Guyton AC. Central nervous system. In: Kurpad A, editors. Textbook of Medical Physiology. 2nd ed. New Delhi (India): Elsevier; 2018. p. 805-14

[xii] Hall JE, Guyton AC. Central nervous system. In: Kurpad A, editors. Textbook of Medical Physiology. 2nd ed. New Delhi (India): Elsevier; 2018. p. 853-60