



NEURO-ANATOMICAL RESEMBLANCE OF THE HYPOTHALAMUS AND ITS PLEXUS WITH THE AGYA CHAKRA- A CADAVERIC STUDY

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ABSTRACT

This present paper enlightens the establishment of resemblance between the Agya Chakra and its petals with the modern neuro-anatomy. The Chakras are vortices of Pranic energy at specific areas in the body which manage the transmission of Prana (energy) permeating the intact human structures and physiology. Activation of the Chakra through various Yogic practices regulates all the psycho-physiological functions. The Chakras represent various neuronal plexuses and sub plexuses which are related to particular viscera and its physiological functions. Based on the position, structure and various functions described by Acharya and scholars it can be concluded that hypothalamus nucleus and its plexus resemble with the Agya Chakra (presents in between the two eyebrows). A cadaveric study was carried out to correlate and ascertain that the anatomical structures which closely resemble the Agya Chakra can be thought of as hypothalamus, its nuclei and associated neuronal plexuses.

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INTRODUCTION

The word Chakra factually means 'wheel' or 'circle', but in the Yogic context a superior translation is 'vortex' or 'whirlpool'.¹ The Chakras which are the nerve plexuses of important nerves are connected through a network of psychic channels called Nadis, which correspond to the nerves but are more subtle in nature. The major Chakras are seven in number and are located along the pathway of Sushumna (spinal cord) from caudal to cephalic end. Sushumna works as an energy channel from which cosmic and spiritual energy flows through the center of it.² Some Acharyas relate Chakras to specific areas of the brain. But these lay quiescent and stationary form. Activation of these Chakras by performing Yogic practices help to regulate the flow of energy through the Nadis and various subtle channels. Yogic practices (Pranayama and meditation) awaken the dormant areas in the brain via maintaining the flow of Pranic energy with the help of Nadi (psychic channels) and Chakras.³

Agya Chakra

Agya Chakra is the sixth Chakra out of the seven Chakras or energy systems and it is present between the both eyebrows. From the point of view of regional anatomy it is situated in the region of the glabella. This region lies between both the eyebrow at forehead on the frontal bone just superior to the rim of the orbit on each side are the raised superciliary arches.⁴

These are more pronounced in men than in women. Between these arches a small depression area, called glabella is present.⁵ It is also the place of existing of the Sthapani Marma. Agya Chakra, also called the dwelling place of the meditative ability. This is the position also where the women apply bindi, and most of the people put Tilak as the symbol of blessing. Agya Chakra in the form of neural plexus lies in this region. The presentation of the Agya Chakra is the form of a circle has two Dala (petals) with two alphabets Ham and Ksham. Two Dala (petals) of white colour related to Agya Chakra which always represents the realization of astuteness.⁶ This Chakra is the symbol of Lord Shiva in the form of Ardhanarishwara and lies over the center between the both eyebrows and extended up to a whole frontal lobe of the brain. Prana Vayu stays here and by controlling this Prana Vayu Yogis controls Vritti (fluctuation of mind) and achieves knowledge of self realization by concentrating over this Chakra. Anatomically, it is positioned from fore brain to midbrain, behind the center of the eyebrows. This center is also recognized by a range of names such as the third eye, Gyana Chakshu (the eye of wisdom) Triveni (the confluence of three rivers); Guru Chakra and the Third eye of Lord Shiva. It is the proper place of Manas (psyche).⁷ The chief element of this Chakra is the mind. This is the center where perception and sixth sense develop. When Agya Chakra is awakened, the mind becomes steady and strong, and full control over Prana is gained. On the psychic plane, this point is the overpass between the

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psychological and spiritual dimensions. Therefore, Agya Chakra is responsible for supramental faculties such as clairvoyance, clairaudience and telepathy.⁸ When Agya Chakra is awakened, it is possible to send and receive thought transmission through this center. It is like a psychic doorway opening into deeper and higher realms of awareness. Stimulated Agya Chakra develops all the faculties of the mind, such as intelligence, memory and concentration. For the stimulation of Agya Chakra pressure is applied over the glabella, point of Bhrumadhya (between both eyebrows).⁹ The region of Agya Chakra lies posterior to Glabella including the structures crista galli, cribiform plate, cavernous sinus, hypophysial gland, hypothalamus and colliculus nuclei and associated plexuses. So the expanse of Agya Chakra may lie in antero-posteriorly areas from cavernous sinuses to hypothalamus. This is the residential place of Prana Vayu, Sadhaka Pitta (Siro Hridaya) and Tarpaka Kapha. The functions of these elements are similar to functions of Agya Chakra that are described by Swami Purnananda (Sat Chakra Nirupana) and Nityabodhananda R. (Ajna Chakra).¹⁰

MATERIAL AND METHODS

Study Design

The Objectives of this study were

1. To identify the suitable position of the Agya Chakra in the brain.
2. To establish the relation of petals (Dala) and its Bijakshara of the Agya Chakra with hypothalamus and its associated nuclei and neuronal plexuses.
3. To establish a relation between neuro-anatomical structures of Agya Chakra and its applied physiology as described in various Tantrik and Yogic literatures.

Materials

- To elucidate the Neuro-Anatomical structure of Agya Chakra a variety of references from Samhitas, related textbooks of Ayurveda, Yogic and Tantric literature, journals, research papers along with various databases were studied and corroborate with supportive references from modern anatomy and physiology literatures.
- Simultaneously six cadavers (4 adult males and 2 adult females) were dissected to appreciate the concerned structures.
- Bone cutter, chisel, saw, hammer, complete dissection kit and tray, gloves, colours, brush and camera.

Method

Literary Study

Keep in mind the basic structures may involve in Agya Chakra, analytical and critical review of avail ancient literature has done. Comparative resemblance has done also among neuronal plexuses of the hypothalamus region with Agya Chakra.

Cadaveric Study

To accomplish the objective of this study dissection of six cadavers (3 males and 3 females) was done in the dissection hall in the department of Rachana Sharir, Faculty of Ayurveda, IMS, BHU, Varanasi. Step by step of dissection has been followed systematically under the guidance of modern anatomy dissector (Cunningham's and Grant's).¹¹ First marking were done on the cadaver regarding the position of

the region of the Agya Chakra at the front of the head with another area for the purpose of removal of the vault. Removal of a vault or calvaria marking also follow the instruction of modern literature.¹² After marking, a big hole was made by a large digging bar with handle and inserted in the antero-posterior direction of Agya Chakra. The purpose of this procedure was to follow all the anatomical structures which lie in the area of Agya Chakra. Fine dissections were done carefully to correlate the structures. The required information has been collected from step wise dissection and was correlated with various modern and Tantrik literatures. After that proper discussion with neurologist appropriate conclusion was drawn.

Observation

Anatomical Structures Resembling with the Dissected part of the Cadaver

1. With the help of fine dissection it was found that the structures that were pierced by digging bar behind the region of Agya Chakra, were supra chiasmatic nuclei, hypophysial fossa, thalamus, hypothalamus nuclei and the pineal body.
2. During the comparison of Agya Chakra it can be correlated as main circle with thalamus, two petals with the Hypothalamus, both Beejakshar with pituitary and pineal gland.
3. This cadaveric study showed all the related structures of the Agya Chakra and its petals with centered hypothalamus nuclei and its plexuses.

Physiological Aspects of Agya Chakra

Agya Chakra is often called as "center of command" or chief commanding or regulating center on the basis of its applied physiological aspects. The Hypothalamus (representing the circle of Agya Chakra) with the help of it's all associated nuclei is performing a function of a leader or can act as a ruling personality over most of the physiological activity of body and mind. Meeting point of three Nadis (Ida, Pingala and Sushumna) forms a triangular circle called as Triveni of Sangama, from where the information may communicate (receive and relay) with the other parts of body and mind. This Triveni point represents the thalamus also known chief relay station.¹³ Supra chiasmatic nucleoli and paraventricular nucleus with the supraoptic nucleus of hypothalamus regulates the functions of the pineal and pituitary endocrine glands which act like two petals with Beejakshar Ham and Ksham respectively. Preoptic region of hypothalamus participates in regulating the autonomic activities. Through this hypothalamus controls and integrates balancing activity of sympathetic and parasympathetic nervous system, represents the power of Lord Hakini Shakti.¹⁴

DISCUSSION

Based on the observations hypothalamus mainly represent the Agya Chakra in the form of a large circle. Some scholars as Acharya Athawale and Swami Shivananda also established an equality between the Agya Chakra and hypothalamus, pineal and pituitary glands. Thalamus and its plexuses as a chief relay center resemble with Triveni or Sangam center as its chief center. Both the Petals and its Beejakshar with the pineal and pituitary glands.¹⁵ Agya Chakra as "Commanding center" overrules and regulates the functions of all the physiological aspect by controlling and regulating the autonomic nervous

system and endocrine system. That's why it is also described as the center for concentration.^{16, 17} Through the regular practice of Pranayama and Dhyana at this site Yogi can develop self control via regulating autonomic nervous system according to their willpower mainly by developing the control over the hypothalamus because all the qualities described through Agya Chakra are directly governed by the hypothalamus.¹⁸ According to Satyananda, Agya Chakra is being a center of psychic energy controls certain higher or paranormal abilities. The Chakra is also closely associated with particular systems and organs of the physical and psychic body, including the brain. According to this study and on the basis of described functions and structure of the Agya Chakra in various ancient literature, it is found that Agya Chakra is very similar in functions and structure to the prefrontal cortex, thalamus, hypothalamus and limbic system as a group in which thalamus acts as an important component of the pathways within the brain that control pain sensation, attention, and wakefulness.¹⁹ During the description of the Nadis and Chakras Acharya Damodara Sharma Gaud, in his book Parishdham Shabdhartha Shariram (anatomical terminology of Ayurved) has described that Chakras are formed by communication of various Nadis (neural fibers) which are the element of autonomic nervous system fibers.²⁰ The hypothalamus acts as the integrator for autonomic functions, receiving autonomic nervous system regulatory input.²¹ The Ajna Chakra controls and energizes all the Chakras present in the body as Vishuddhi Chakra considered as thyroid, Anahata Chakra present in the region of the breasts, Manipura Chakra considered as the adrenal glands, Swadhistana and Muladhara Chakras present in the gonads. The hypothalamus has a number of very important connections with the pituitary gland and produces a diversity of hormones. Almost all the endocrine glands along with pituitary glands are under control of hypothalamus through hypothalamo-hypophyseal relationship. The hypothalamus controls the functions of all the endocrine glands by secreting releasing or inhibitory hormones acting on the pituitary gland. In that response pituitary gland secretes many stimulating hormones which act on different endocrine glands.²² Thus, all these endocrine glands are all positioned at the traditional points of the Chakras and their functions are remarkably comparable to the conventional narratives of the Chakra functions. Agya Chakra energizes the body, in the same way hypothalamus controls and incorporates activities of the autonomic nervous system, which regulates contraction of smooth muscle and cardiac muscle and the secretions of many glands. Axons extend from the hypothalamus to parasympathetic and sympathetic nuclei in the brain stem and spinal cord. The hypothalamus is a major controller of visceral activities including regulation of heart rate, oxygen demand and prepares the body for emergency conditions.^{23,24} So, conscious management of autonomic nervous system may be potent and standardized by some well planned Yogic procedures under the control the Agya Chakra (prime meditation faculty). This study establishes the prior anatomical concept of Agya Chakra up to a certain limit and provides a new dimension to understand it.

CONCLUSION

On the basis of the above discussion anatomically the Agya Chakra is very close to the triangular center inside the Chakra with thalamus, circle of the Chakra with the hypothalamus and both petals with Beejamaantra related to the pituitary and the pineal glands and its applied is also like hypothalamus along

with the pituitary and the pineal glands and Yogic practices regulate psycho physiological activities (regulated by the autonomic nervous system) according to individual's will.

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