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**THE CONCEPT OF THE NERVOUS SYSTEM IN *AYURVEDA***

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**KUMAR BMN**

Associate Professor, Department of Rachana Sharir, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi (U.P.)

**\*Corresponding Author: Dr. Balla Mohana Naga Kumar: E Mail: [drbmnkbhu123@gmail.com](mailto:drbmnkbhu123@gmail.com)**

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**ABSTRACT**

*Acharya Sushruta* and other profounders of *Ayurveda* have not described the structural aspect of the nervous system; they were known for its functional aspect. According to them, all the activities of the body are done by *Vata*, the chief among the *Tridosas*. Every *Ayurvedic* scholar knows that *Ayurveda* stands on the theory of the *Panca Mahabhuta* and *Tri-Dosa*. Among three *Dosas*, *Vata* plays an important role as mentioned by *Charaka* “*Vayustantrayantradharah*” etc. where “*Vata*” can be compared with the nervous system (in the living bodies) of the contemporary sciences. Thus *Vata* in terms of modern physiology closely resembles the neural impulse (motor, sensory and integrative), which is also an invisible, self-originated, and propagated as metabolic reaction sequence bringing about all activities of the nervous system, namely motor, sensory, integrative (higher intellectual functions).

**Keywords: *Vata, Dhatu, Shira, nerve, brain***

**INTRODUCTION**

Nowadays, the nervous system is described in two aspects i.e. anatomical or structural and physiological or functional; the former describes the brain, spinal cord, and nerves, while the latter describes the nerve impulse, its transmission through the nerves,

stimulation of all the parts of the body (inclusive of the mind), for performing their functions [1]. Considerable knowledge regarding the neuro-physio-anatomy can be made available in *Ayurveda*, by *Acharyas* in various places to describe the meaning of a

particular anatomical structure or physiology of a structure of the body, such as the terms *Sira*, especially *Vatavaha Sira*, *Dhamani*, *Srotas*, *Snayu*, *Nadi*, *Marma*, *Manas*, *Hridaya* and *Shira*, etc., through these structures *Vata* performs their functions. They are components of the nervous system. Many of the physical and mental phenomena described by modern physiologists are primarily the activities of the central, autonomic, and peripheral nervous systems. They can be identified by the functions ascribed to *Vata* in the classical *Ayurvedic* literature [2].

#### ***Vata Dosa***

*Vata Dosa* is considered as the ruler or controller of the *Dosa* system. Out of three *Dosas*, *Vayu* is the most predominant one. It is omnipotent and has movements in all directions. It is quickest and controls every action of the body [3]. That is why *Sharangadhra* said-*Pitta*, *Kapha*, the *Malas* (excretes), and *Dhatu*s (tissues) are not as active as the *Vayu*. It is the *Vayu* which drives them hither and thither in the body; just as the cloud is driven by the wind [4]. The *Vata* can move without any help or bring things into motion and to make known.

The term “*Vata*” has been derived from the root (verb word) *Va Gati Gandhanayoh*

having the meaning of “*Gati*” or movement and “*Gandhana*” means continued effort or pressure perseverance manifested, intimation and information [5]. The term *Gati* is also used in the sense of *jnana* (knowledge) *Gaman* (movement) and *prapti* (obtaining or achievement) while “*Gandhana*” denotes *Suchana* or information. Its general function is motility which in turn works for mental functions like sensations and knowledge also. *Vata* is not only self –originating (*svayambhu*) but also self-propagating in its quality to traverse in the *Vatavaha nadis / Srotases* [6].

#### **Qualities and functions**

Describing its qualities and functions, they have said as follows

*Vata* is *Svayambhu* (self-born), *Svatantra* (independent), *Sarvagata* (all-pervasive), *Avyakta* (invisible), *Vyaktakarma* (its functions noticeable), *Acintya Virya* (of unimaginable capacity), *Asukari* (quick in action), *Kriyanam karana* (cause of all functions), *Indriyarthopasamprapti* (cause for sensory perceptions), *Niyantaprachetaca Manasa* (controller and activator of the mind) and *Dosa Dhatu Agni Samyakara* (equilibrium of humor, tissues, and digestion) and many more [7, 8].

Table 1: The functions of *Sharira Vata* in its equilibrium state are summarized as below [9]-

I. Functions related to emotions and mind	1. <i>Utsaha</i> (enthusiasm) and <i>Harsha</i> (joy) 2. Control of the mind from indulging in undesirable senses and direct it towards desirable senses.
II. Motor functions	1. The activity of skeletal muscles 2. Actions of involuntary muscles 3. Secretary functions
III. Sensory functions	1. <i>Vata</i> stimulates all sensations. 2. The receptive impression of the <i>Artha</i> on the sense organ is transformed into the nerve impulse in the organ and carried through the <i>Sanjvaha Srotas</i> (channels of nerve impulse) via the <i>Manas</i> (mind) to the <i>Indriya Buddhi</i> (respective cortical centers).
IV. Integration of motor and sensory functions	The <i>Tantra Yantra Daraha</i> function of <i>Vata</i> signifies this integration. This function incorporates the maintenance of the equilibrium of the body and also the kinesthetic sense.
V. Biochemical functions	Even though the chemical reactions in the body are conducted by the respective <i>Pittas</i> , the planning is managed by the <i>Vata</i> . 1. <i>Dhatuvyuhakara</i> – synthesis of the <i>Dhatus</i> from the nutrients present in the <i>Rasadhatu/ahararasa</i> (nutritive fluid) into definite structures according to the plan of the requirement to the body. 2. Regulation of the functions of the <i>Dhatus</i> (tissues).

## DISCUSSION

Anatomy discusses the structure of the different parts of the body, while physiology discusses how different actions are carried out by these anatomical structures. *Vata Dosa* is responsible for all the activities (internal as well as external) of the body. Every *Ayurvedic* scholar knows that *Ayurveda* stands on the theory of the *Panca Mahabhuta* and *Tri-Dosa*. Among three *Dosas*, *Vata* plays an important role as mentioned by *Charaka* “*Vayustantrayantradharah*” etc. where “*Vata*” can be compared with the nervous system (in the living bodies) of the contemporary sciences. All these deal with various movements within the body and also outward movements like *Gati*, *Utkshepana* (lifting), *Avakshepana* (throwing down), and

other activities of *Panca Jnanendriya* (sense organs), *Panca Karmendriya* (motor organs), *Manas* (mind) and *Buddhi* (knowledge). The entire description of *sharira vayu* seems to be an invisible, self – generating, self-propagative energy, which is responsible for conduction, regulation, and integration of all functions-movements (motor activities), knowledge from exterior and interior (sensory activities) and integrative activities (higher intellectual functions), and structure of the body [10].

The brain (*Mastishka* or *shira*) is called as ‘*Manava Rajadhani*’ or king or ruler. Because of the important qualities of *Vata* viz. *Amurta* (invisible), *Anavasthita / Calatva* and *Svayambhu* (self – generating), coupled with its main functions of *Gati* (movement) and *Gandhana* (sense), as understood by its

definition, the main seat of *Vata* has to be considered as *Shiras* or *Mastishka* (brain and CNS) [11].

### **Shiras (Head)**

Considerable knowledge regarding the neuro-physio-anatomy can be made available in *Ayurveda*, but one must have a fundamental knowledge of *Vata Dosa* as well as the very confusing array of glossary used by *Ayurvedic Acharyas* in various places to describe the meaning of a particular anatomical structure or physiology of a structure of the body, such as the term *Shira* (head). The modern medical scholars are also not free from such ambiguity. For example, in the Latin language "myelon" means bone-marrow, but the same word is used to mean "spinal cord". Western anatomists considered every object anatomically encased inside a body canal as bone marrow. To cite a similar example in *Ayurveda*, *Shira* (head) was recognized as an important organ of the human body and its content 'brain'. It is identified as '*Mastishkam*', *Mastulungam*, or *Ghrutam* [12].

According to *Charaka Sutrasthana*, "the part of the body in which the *Prana* (Binding force of life) stays, to which all *indriya* (senses) are said to belong and which is *Uttamanga* (the most important of all organs) of the body is *Shiras*". It is responsible for

sensory and motor functions that run by the power of *Vata*. *Shira* (head) also has to be considered as the seat of *Vata*, according to the *Atharvaveda*. This statement that *Shira* (head) is the seat of all *Indriya* (senses) indicates that all the five senses are perceived by the *Panca indriya Buddhis* (knowledge of five senses) which are located in the *Shira* (head) [13].

There are also other points to establish this fact:

1. The sages describe the human being as having the "roots on the top and branches below" so by striking at the roots, the disease can be cured very quickly since the *Prana* (life) resides in such a chief organ-like head it should be protected with great effort [14].
2. *Charaka* states that the *Shiras* (head) occupies the prime place amongst the vital organs of the body and it is the seat of the vital centers and all the sense faculties. '*Shira*' in this context refers to the brain and the term '*Indriya*' here stands for *Jnanendriya* (cognitive or sensory organs), *Karmendriya* (cognitive or motor organs), and *Ubhaya Indriya* (*Manas*). The *Shira* or head or brain is the abode of senses, sensory channels, and channels carrying *Prana* (life) as the sun is the abode of its rays [15].
3. *Charaka* has described the *Pranayatana* (seats of life) which are ten in number. In

which *Murdha* or brain has been mentioned as one of them. All sensory and motor organs along with their '*Pranavaha-Srotamsi*' (the life carrying channels), are connected to (their centers in) the '*Shira*' (brain) in a fashion similar to the connections between the sun rays and the sun. Various sensory or descending and motor or ascending tracts, comprising of numerous individual neurons in the nervous system, connect the central nervous system with sensory and motor organs [16].

### ***Mastishka* (Brain)**

Word "*Mastishka*" has been used so many times in *Charaka*, *Sushruta*, and *Vagabhatta* and other *Ayurveda* texts. *Sushruta* was aware of the presence of fatty material inside the skull, named it as '*Mastulunga*' (brain) and that its flow out when the skull is injured. *Dalhana* commenting on the term '*Mastulunga*' (brain) describes it "as resembling solidified ghee present in the head and giving strength to the head". According to *Sushruta* it is described as a controlling and coordinating power freeze like *ghee* that is said to be *Mastulunga* [17]. *Cakrapani* in his commentary on *Charaka Samhita* has described the *Mastishka* as The fatty like substance inside the *Shira* (skull). The method of *Avapida Nasya* (nasal drops) is given by *Charaka*, according to him; if the head is

lowered in excess then the *nasal drops* get in the *Mastulunga* or brain [18].

In *Atharvaveda*, the location of the *Vata* is stated to be located in the upper portion of the *Mastishka*, the brain which controls everything. *Vata* having its top position in the human body initiates or inspires all the allotted activities to every organ of the body. The control of the nervous system is also maintained by *Mastishka*, (head and brain) and *Prana Vayu* governs it [19].

Based on the above-stated points, it can be conclusively established that the functional seat of *Vata* is the *Mastishka* ((brain and CNS). The *shiras* (head) contains *Mastishka* or *Mastulunga* and it is *Snigdha* (unctuousness) in nature. The *Mastulunga* (brain) resembles the partly melted ghee. It is a fact that the brain is rich in lipids and proteins, the former being relatively more in quantity, as between the gray matter and white matter; the later contains more of lipids because of the presence of a large number of myelinated fibres in it [20]. If the physical characters of nerve proteins especially the mucoproteins and lipids are described in *Ayurvedic* phraseology, they are *Snigdha* (unctuousness).

### ***Sharira Vata* and nervous phenomenon**

It has been often asked like the other constituents of the body whether the *Vata* can

also be quantitatively determined and experimentally demonstrated. An available description of 'Vata' in ancient texts is mostly qualitative and functional, concentrating on the functions of 'Vata'. We find very much resemblance with that of nerve impulses which have been described as a self-propagating disturbance in nerve fibers, creates so many inquiries of its nature and resources. If we associate this inquiry of nerve impulse with electrical phenomena, it will not be justified as the electrical impulses can be measured by a galvanometer, voltmeter, or like other instruments, whereas the nerve impulses fail to stand this type of test. On the whole, it rather looks impossible to quantitative and to state the nature of nerve impulses except presuming it as a biological chemical reaction that propagates along the nerve fibers. All the qualities and functions of *sharira-Vata* as stated in our ancient texts stands in always similar if taken in contrast to the nerve impulses that are nothing but a self-propagating biological chemical reaction occurring in the nerve fibers. Thus we can presume the *sharira-Vata* as a biological force or in other words a chemical reaction sequence that occurs during life processes [21].

All these properties and functions of *sharira Vata* exactly correspond with the nature and

functions of the nerve impulse. Though the nature of the nerve impulse is not fully understood what has been established now are—"that it is a process of Physico-chemical change in the nerve fiber, is self-generated, self-propagating, its rate of travel ranges from 6 meters to 120 meters per second, it is not visible and it is of one kind only-impulse ending in the skin creates sensations of cold, heat, pain, etc, ending in a gland it makes for secretions, etc. All the functions of all the parts of the body and mind are made possible by the nerve impulse only acting as the stimulator". Comparing this ancient and modern knowledge we can without hesitation assert that *Sushruta* and others like him had a good knowledge of the functional aspect of the nervous system [22].

Consider the definition of *Vata* also indicates the two main functions of nervous system viz. motor and sensory.

**A.** The first word *Gati* indicates "to move" or to cause movement or motor activities of the body.

**B.** The second word is *Gandhan*, term *Gandhan* indicates *Suchna* or information or *Jnana* (knowledge) through *Ghranendriya* (organ of smell) which is sensory, it is the function of the olfactory nerve, which is the first cranial nerve and sensory in action. So, the term *Gandhanyoh* represents all other

sensory organs and nerves which are also described under the heading of *Indriya Panca Pancaka*.

Different qualities of *Vata* also suggest *Vata* concerning nervous impulse. **1.** According to *Sushruta*, *Vayu* is “*Svayambhu*” it may be due to nerve impulse is also "self-originated" and "self-generating" or "self-propagating" energy, which is responsible for the conduction, regulation, and integration of all vital functions and structures of the body, both are not visible yet actions, works are potent and can manifest. *Vayu* abounds in the fundamental quality of *Rajas*, the principle of cohesion and action. It is instantaneous in action and radiates throughout the body *Asukari* (immediate action or swiftly) [23].

**2.** The nature of nerve-impulse is not yet known properly or is not yet knowable. It is understood only as reaction or excitation generated in the nerve fiber due to stimulus on the generation of action potentials, which may be compared with - "*Anavasthita*" property of *Vata Dosa*.

**3.** The stimulus travels along the nerve and the propagation of the change is inferred by the effect which follows i.e. sensation, secretion and movement, in simple words while the impulse itself is *Avyakta*, it is, however, known by the work it does- "*Vyakta - Karma*", which may be compared

with - "*Avyakovyakta - Karma*" property of *Vata Dosa*.

**4.** The neuron is not a mere conductor of impulses, like a wire of an electrical current; it has an inbuilt facility of generating the impulse in itself and transmission of the same. This clearly explains *Ayurvedic* term "*Svayambhu*", self-originated and the term has been used by *Ayurveda* for the somatic *Vata*. Probably, the term '*Bhagavana*' is also used in the same meaning because God is never born but it expresses its presence by the power it has by its own [24].

## CONCLUSION

*Sushruta* and other profounders of *Ayurveda* have not described the structural aspect of the nervous system; they were known for its functional aspect. According to them, all the activities of the body are done by *Vata*, the chief among the *Tridosas*. The above discussions and tabular statements indicate that *Mastishka* and *Vatavaha Srotas* (brain and nervous system) are the important seats of *Vata* in respect of its two functions viz. *Gati* and *Gandana* i.e motor and sensory functions. The qualities *Amurta*, *Anavasthita / Calatva*, *Svayambhu*, *Sukshma*, etc. of *Vata* indicate that phenomenon of *Vata* can be assumed as the phenomenon of the nerve impulse.

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**REFERENCES**

- [1] Govind Raju.U, Usha V N K, Neurological Concepts In Ayurveda, Chaukambha Sanskrit Prakasan, Varanasi, First edition, 2007, p-07.
- [2] Ranade S, Deshpande R. R., Chobhe S, A textbook of Sharira-Kriya Vijnan, Part-I, Chowkhambha Sanskrita pratishthan, Reprint edition, Delhi, 2009, p-52.
- [3] Citta ranjan das, A textbook of physiology, Volume-I, Chowkhambha Sanskrita pratishthan, Reprint edition, Delhi, 2015, p-71.
- [4] Radha Krishna P, Sarngadhara Samhita Purva Khanda, Baidyanath Ayurveda Bhavan, 3<sup>rd</sup> edition 1984, p-79.
- [5] Sushruta, Sushruta samhita, sutrasthana, English translation by Prof. Srikantha Murti KR, Chaukhambha Orientalia Publishers, Volume-I, 3<sup>rd</sup> edition, Varanasi, 2007, p-221.
- [6] Gupta. L.P., Essentials of Ayurveda, Chowkhambha Sanskrita pratishthan, Reprint edition, Delhi, 2001, p-108.
- [7] Agnivesha, Charak Samhita, sutrasthana, Sharma PV. English translation, Chowkhambha orientalia, Volume- I, Revised edition, Varanasi, 2007, p-237.
- [8] Sushruta, Sushruta samhita, nidanasthana, English translation by Prof. Srikantha Murti KR, Chaukhambha Orientalia Publishers, Volume-I, 3<sup>rd</sup> edition, Varanasi, 2007, p-08.
- [9] Subrahmanya Sastry VV, Essentials of basic Ayurveda concepts, Amruta bindu series, 1<sup>st</sup> edition, 1999, p-11
- [10] Saroja N., Ram Reddy G.P., VenkataShivudu K., Lavanya G, Concept of vata vs nervous system. Review article. Int J Ayurvedic Med. 2013; 4(4): 272–281.
- [11] Venil N. Sumantran, Pratibha P. Nair, Can the vagus nerve serve as biomarker for *vata dosha* activity? Journal of Ayurveda and Integrative

- Medicine, 2019 Apr-Jun; 10(2): 146–151.
- [12] Keswani N.H.-Editor, The Science of medicine and Physiological Concept in Ancient and Medieval India, page-100
- [13] Agnivesha, Charak Samhita, sutrasthana, Sharma PV, English translation, Chowkhambha orientalia, Volume- I, Revised edition, Varanasi, 2007, p-313.
- [14] Rama Sundara Rao M. , Sharira Rachana Vignanam , Vijayawada – 520002, 1<sup>st</sup> edition, 2005, p-236
- [15] Agnivesha, Charak Samhita, siddhisthana, Sharma PV, English translation, Chowkhambha orientalia, Volume- I, Revised edition, Varanasi, 2007, p-212.
- [16] Patawardhan Kishor, Human Physiology in Ayurveda, Chukhambha Orientale, Varanasi, 1<sup>st</sup> edition, 2005, p-45.
- [17] Desai Ranjit Rai, Ayurveda Kriya sharir, Vaidyanatha Ayurveda Bhavana Pvt.Ltd., Calcutta, 4<sup>th</sup> edition, 2018, p-22
- [18] Agnivesha, Charaka Samhita Sutra Sthana, Jadavaji Trikanji Acharya with the Ayurveda Dipika commentary of Chakrapanidatta, Chaukhambha Orientalia Publishers, Varanasi, reprint edition, 2009, p-285.
- [19] Dwivedi K., Dwivedi B., Vedo Me Ayurveda, Vishwabharati Anusandhana Parisada, Jyanapura, 1993, p-53
- [20] Tortora and Angasontakos, Principles of Anatomy and Physiology, Harper and Row publishers, 12<sup>th</sup> edition, Newyork, 2013, p-496
- [21] Awasthi. H.H, Thesis on the study on neuro physio anatomy in Ayurveda with special reference vata dosa, 2010, BHU, Varanasi.
- [22] Srikantha Murthy KR, Sushruta Samhita sharira sthana English commentary, page-147, 148
- [23] Bishnu Choudhury, Approach To Neurological Disorder In Ayurveda, Indian journal of medical research and pharmaceutical sciences, 2015, 2(12); 65-71
- [24] Ranawat AK, A Brief Review about Ayurveda, Int J Complement Alt Med, 2017 5(6): 170.