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“AN ANALYSIS OF VATA DOSHA IN RELATION WITH NEUROTRANSMITTERS.”

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ABSTRACT:

The Neurotransmitters are referred as the molecules of the chemical messengers in the body. Their job is to transmit signals from nerve cells to target cells. These target cells may be in muscles, glands, or other nerves. The nervous system controls the body's organs, psychological and physical functions and play important roles in the system. In Ayurveda the vata dosha the controller of the body and is the causation for all the movements in the body. The dosha classifies in to 5 types are prana vata, udana vata, samana vata, vyana vata, apana vata. All these are helping all kind of movements in combination with other dosha's and as same as the neurotransmitters. When Neurotransmitter increased level causes that we can consider like excitatory actions of the neurotransmitters. The same effect of the vata vridhi lakshanas we can see in this condition. There will be sudden, high- frequency firing of local neurons in the brain, which can even lead to seizures. The causes of over productions of neurotransmitters are Genetics, environment, chemical and nutritional deficiencies are some factors. Considering both vata dosha and neurotransmitters both can be related each other as they are the main initiator of the body functions. The utsaaha functin of the vata dosha can be consider as neurotransmitters in Ayurveda. Utsaaha meant to all the bodily functions and when vata is the main cause for all the bodily functions.

KEYWORDS: Neurotransmitters, vata dosha, vridhi lakshanas, kshaya lakshanas, types of vata dosha.

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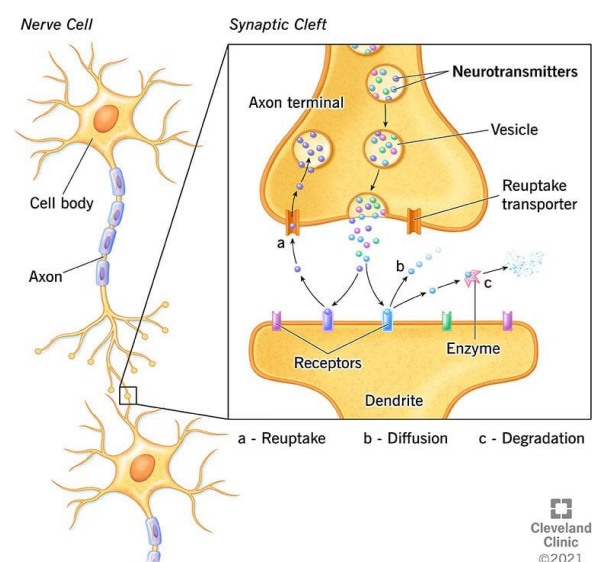
INTRODUCTION:

The Neurotransmitters¹ are referred as the molecules of the chemical messengers in the body. Their job is to transmit signals from nerve cells to target cells. These target cells may be in muscles, glands, or other nerves. The Communication happens in the synaptic cleft. Here, electrical signals that have travelled along the axon are briefly converted into chemical ones through the release of neurotransmitters, causing a specific response in the receiving neuron. A neurotransmitter classifies are: excitatory (stimulate brain) which are glutamate, aspartate, nitric oxide. Inhibitory or modulatory (calm the brain and helps to create balance) which are glycine, GABA, serotonin, dopamine. Both excitatory and inhibitory are acetylcholine and epinephrine. The brain needs neurotransmitters to regulate many necessary functions, including:

- heart rate & smooth muscle control
- breathing
- sleep cycles
- digestion
- mood & emotions
- concentration & learning
- appetite
- muscle movement & motor control

The nervous system controls the body's organs, psychological and physical functions. Their neurotransmitters play important roles in the system. In Ayurveda the vata dosha² the controller of the body and is the causation for all the movements in the body. The dosha classifies in to 5 types are prana vata, udana vata, samana vata, vyana vata, apana vata. All these are helping all kind of movements in combination with other dosha's. Acharya considered vata as "vayu tantra yantra dharaha", when it is in normal states controls the functions of all organs the body. Controls, regulate and stimulates the mind and all

sense organs. Maintain the compactness of the body and causes for happiness and enthusiasm. Regulates the digestive fire and regulates and helps for movements of all channels. Helps to eliminate waste products from the body and helping the fetal growth. When it is imbalanced in the body it directly affects the both physiological and psychological aspects of body and shows symptoms like loss of strength and complexion, derangement in the sense organs and body, deforms the embryo, fear, anxiety etc. So here made an effort to connect with vata dosha and neurotransmitters.

**Action of neurotransmitters⁵****Functions of pancha vata³**

Prana vata :- Seated in the head (murdha) and it travels along the area like uras (thorax) and kantha (throat). It maintains and balances the budhi i.e., intelligent, judgment and memory and it helps to regulate the sneezing, spitting, belching reflexes, respiration, deglutition and helping for thought and thinking process. So, there are connections in terms of nerves like olfactory nerve (for smell), optic (for vision), trigeminal (sneezing reflex), glossopharyngeal nerve (for swallowing and chemoreceptors), facial nerve (motor and sensory), vagus nerve (for

respiration and belching), concern with both sensory, motor and voluntary functions.

Udana vata:- It is seated in the ura peadesha (thorax). Travels from nasal passage to umbilical region through throat. Does functions like regulation in speech, enthusiasm and energy production. Gives strength, gives complexion and helping for memory functions.

Vyana vata⁴:- Seated at hrudaya(heart). It travels along the body with high velocity(kritsnadehachari). All motor functions of the body such as mahajava (rapid movement), gathi(movement), helping for flexio n and extension of body parts. Helping for closing and opening of the eyes (consciousness and unconsciousness of the body).

Samana vata:- located at the sight of agnti sthana, travels all over the koshta(GI tract). It helping for the movement of the food in the GI tract and helping for digestion and absorbtion of the food in the tract.

Apana vata:- located in perineal region (Apana pradesha). Travels along the sroni(pelvis) basti(urinary tract)ling(external sexual organs) and uru(thighs). It helping for the expulsion of sukra(semen), artava(menstrual blood), sakrit(fecal matters), mutra(urine) and garbha(the product of conception).

Functions of Neurotransmitters⁵: There are N-number of neurotransmitters in the human body. Each one having different functions in the body and classified under the heading like Inhibitory, Excitatory and Both neurotransmitters. Can be classified in to other 5 types like

Biogenic amines: -

Catecholamines: -Dopamine, norepinephrine, and epinephrine.

Indolamines: - Serotonin (5-hydroxytryptamine [5-HT]), Histamine.

• Amino acids: (Gamma-aminobutyric acid (GABA). Glycine, Aspartate, Glutamate.

• Neuropeptides: - Substance P, Endorphins and enkephalins, Somatostatin, gastrin, cholecystokinin, oxytocin, vasopressin.

• Purines: - Adenosine, Adenosine triphosphate (ATP).

• Small molecules, e.g., gases and lipids: - Nitric oxide, Carbon monoxide, Cannabinoids.

Acetylcholine - Controls muscle tone, movements and memory. It is present in both central nervous system (CNS) and peripheral nervous system (PNS). Cholinergic system undergoes degeneration in Alzheimer's disease, the leading cause of dementia.

Dopamine¹⁰ - Mediates pleasure and reward system in the brain and is important for motion, mood, reward. It also has inhibitory control

GABA - Major inhibitory neurotransmitter in the brain

Glycine - Major inhibitory neurotransmitter in the spinal cord

Norepinephrine - Acts both as a neurotransmitter and hormone. Mediates flight and flight response. which projects all over the brain and partakes in the sleep-wake cycle, attention, and vigilance. Norepinephrine is synthesized from dopamine.

Serotonin - Mediates mood, motivation, has some role in memory and pain pathways. Roles in many behaviors such as mood, control of eating, sleep, arousal, and pain pathways. It also plays important roles in the higher cognition and emotions.

Glutamate - Most abundant excitatory neurotransmitter in the brain. It is found in almost all CNS structures. Since this is a major neurotransmitter in the brain and spinal cord.

Epinephrine - Its effects are implicated in movement, attention, learning, and addiction.

Peptides - Endogenous opioids are peptides with analgesic properties which mediate "stress analgesia." The examples include endorphins, enkephalins, dynorphins, etc. Apart from they involved in regulation of pain for different brain areas and enhancement of flight or flight responses.

Relation between vata dosha⁹ and neurotransmitters: Prana vata mainly seated in the head region, where the seat of prana or the life and the mind. When the prana is lost the life is also lost. As the glutamate is considered as the major neurotransmitter in the brain and which causes the brain cell death at high concentration. There by leading the total loss of prana or the entire life. Udana vata is traverses from nasa to nabhi, can be understood like the origin and ending of the spinal cord and the head region. It can be understood as the mainly functions acetylcholine with other neurotransmitters. It presents both in the CNS and PNS system. And regulates the bodily functions and learning and attention etc. Vyana vata situated mainly in the hrudaya (heart) region. It helping for the rapid movement and other movements. can be understood like as dopamine and epinephrine and norepinephrine neurotransmitters. As it helping for fight or flight responses and other immediate bodily movements. When its derangements cause abnormal body movements. Samana vata situated mainly in the region of the agni sthana where it helping to regulate the digestion. And regulation the functions of the gut movements. And regulates the functions of the abdominal organs too. And can be understood as the functions of the serotonin neurotransmitter. Where the 90% of the serotonin released from gut only and regulating the gut brain axis directly. Apana vata seated in the perineal region and it regulates the sexual arousal,

regulating the bodily excreta, regulates the menstruation and functions of bladder. Can be understood the functions of serotonin and dopamine neurotransmitters. When considering the types of neurotransmitters vata dosha also can be classified in to inhibitory and excitatory and both functions. Each vata acting these functions individually. Each vata dosha and neurotransmitters are closely related with each other with varying their functions.

DISCUSSION:

Vata vridhi lakshana and body functions¹¹

:Increased state of vata dosha causes karshya(emaciation), karshnya(blackish discoloration), ushna kamitva(liking towards the hot things), kampa(tremors), anaha(distention of abdomen), sakrit grha(constipation) bala and indriya bramsha(lack of strength and derangement of the sense organs, nidranasha(decreased sleep), pralapa(lack of enthusiasm), brama(giddiness), dheenata(feeling of sick). When Neurotransmitter increased level causes that we can consider like excitatory actions of the neurotransmitters. The same effect of the vata vridhi lakshanas we can see in this condition. There will be sudden, high-frequency firing of local neurons in the brain, which can even lead to seizures. The causes of over productions of neurotransmitters are Genetics, environment, chemical and nutritional deficiencies are some factors.

Vata kshaya lakshana and body functions:

Angasada(weakness in the body- mainly motor functions), alpa bashana(feeble speech), decreased consciousness and sensory loss, praseka(increased salivation), alasya(laziness), gauravata(heaviness), svaitya(pallor), saitya(coldness), slathangata(laxity of organs), svasa(dyspnea), kasa(cough), atinidra(excessive sleep).¹² When deficiency of neurotransmitters causes difficulty in

initiating or completing tasks, poor concentration, lack of energy, lack of motivation, mood swings and some of the behavioral changes can be seen. The above-mentioned causes can be seen in this condition also. This condition can be related to the inhibitory actions of the neurotransmitters. Which make them less likely to fire messages of their own.

CONCLUSION:

Considering both vata dosha and neurotransmitters both can be related each other as they are the main initiator of the body functions. The utsaaha function of the vata dosha can be considered as neurotransmitters in Ayurveda. Utsaaha meant to all the bodily functions and when vata is the main cause for all the bodily functions.

Prana vata mainly seated in the head region, where the seat of prana and mind. As the glutamate is considered as the major neurotransmitter in the brain and which causes the brain cell death at high concentration. Can be related to prana vata. Udana vata is traverses from nasa to nabh, it can be understood as the mainly functions of acetylcholine. Vyana vata situated mainly in the hrudaya (heart) region. It helping for the rapid movement and other movements. Can be understood like as dopamine and epinephrine and norepinephrine. Samana vata situated mainly in the region of the agni sthana and can be understood as the functions of the serotonin neurotransmitter. Apana vata seated in the perineal region can be related to the functions of serotonin and dopamine neurotransmitters. The functions of neurotransmitters - these chemical messengers that carry body functions boosting and balancing signals in the brain and for keeping the brain functioning, which are having both actions like excitatory and inhibitory functions. And this can be again

related to vata dosha vridhi and kshaya. This can be related to the functions of inhibitory and excitatory functions of neurotransmitters.

REFERENCES:

1. Qiu Y, Peng Y, Wang J. Immunoregulatory role of neurotransmitters. *Advances in neuroimmunology*. 1996 Jan 1;6(3):223-31.
2. Sreekumar T, Ashtanga hridaya with English translation and commentary. 2011 jan ed.mannuthy:Harisree hospital;2011.p30-63
3. Sreekumar T, Ashtanga hridaya with English translation and commentary. 2011 jan ed.mannuthy:Harisree hospital;2011.p285-95
4. Sreekumar T, Ashtanga hridaya with English translation and commentary. 2011 jan ed.mannuthy:Harisree hospital;2011.p265-80
5. Webster R, editor. *Neurotransmitters, drugs and brain function*. John Wiley & Sons; 2001 Nov 28.
6. Nguyen L, Rigo JM, Rocher V, Belachew S, Malgrange B, Rogister B, Leprince P, Moonen G. Neurotransmitters as early signals for central nervous system development. *Cell and tissue research*. 2001 Aug; 305:187-202.
7. Patri M. Synaptic transmission and amino acid neurotransmitters. In *Neurochemical basis of brain function and dysfunction* 2019 Oct 23. IntechOpen.
8. Nguyen L, Rigo JM, Rocher V, Belachew S, Malgrange B, Rogister B, Leprince P, Moonen G. Neurotransmitters as early signals for central nervous system development. *Cell and tissue research*. 2001 Aug; 305:187-202.
9. Agnivesha, Charaka, Dridhabala, Chakrapanidatta. In: Acharya JT (eds.) *Charaka Samhita with Ayurveda Deepika*

- commentary. Reprint 2009 ed. Varanasi: ChaukhambaPrakashan; 2009. P.
10. Sheshagiri S. Dopamine and Vata Dosha. Journal of Indian System of Medicine. 2023 Jan 1;11(1):1.
11. Kahate VR, Kodwani VG. CONCEPTUAL STUDY OF VATA DOSHA IN MAHASROTASA WITH SPECIAL REFERENCE TO ENS.
12. Sumantran VN, Nair PP. Can the vagus nerve serve as biomarker for vata dosha activity? Journal of Ayurveda and integrative medicine. 2019 Apr 1;10(2):146-51

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