CRITICAL ANALYSIS ON PHYSIOLOGY OF VOMITING REFLEX

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Received 20-10-2019; Revised 18-11-2019; Accepted 16-12-2019

ABSTRACT

Background: The word Vata derived from the verbal root ‘Va’ meaning is Gati and Gandhana. Vata is responsible for Gati (movement), Jnana (knowledge or perception) and Prapti (obtaining or receiving).

Aims & Objectives: To critically analyze physiology of vomiting reflex in Ayurvedic terms.

Materials & Methods: The Ayurvedic classics were scrutinized regarding the references for derivation of Vata Dosha. Later, physiologico-anatomical aspects of the vomiting with reference to reflexes were studied from modern physiology books. Later, supportive correlation was done between Ayurvedic and modern views to build valid and reliable hypothesis regarding derivation of Vata dosha in relation to the various anatomical and physiological aspects of the reflexes.

Discussion & Conclusion: Physiological importance is emphasized in the word Gamana, Gnyana, Prapti. Prapti refers to physiology of receiving the impulses from the stimulus and receiving the motor response by the effector organ. Gamana refers to movement of impulses from sensory nerve to vomiting center and from vomiting center to effector organ even it signifies the motor response generated in intestine, sphincters, stomach, oesophagus, oral cavity. Gnyana refers to perceiving of the sensory impulses and generating appropriate response by the vomiting center.

Keywords: Gamana, Gnyana, Prapti, vomiting, physiology.

INTRODUCTION

An individual is an archetype of the universe. All the material & phenomenon of the universe are present in an individual. Similarly all those present in the individual are also enclosed in the universe1. The five basic elements exist in all matter. Water provides the classic example: - the solids of iced water are manifestation of the Prithvi Mahabhutha (earth principle). Latent heat in the ice (Agni) liquefies it, manifesting into Jala Mahabhutha (water principle). And then eventually it turns into steam expressing the Vayu Mahabhutha (air principle) the steam disappears into Akasha or space2. Bhuta is that which is not born out of something, but out of which something is born. It is the material cause of substances in the world. When we say Bhuta we mean that subtle level of existence, where as Mahabhutha refers to gross level of existence3. Panchikarana is the process through which invisible Bhutas combine with each other and form the visible Mahabhutas in such a way that all Bhutas are present together in each Drisya Bhuta in varying degrees of predominance. Thus in the physical world everything is a combination of Pancha Mahabhutas & we cannot see them independently4. Thus the five basic elements Akasha, Vayu, Teja, Jala And Prithvi are present in one substance. This proves that all five elements are present in all matter in the universe5. Visualization of the identity of the individual with the universe paves the way for salvation. The body is described as the modified form of Mahabhutas hence the description of the identity of the individual & the universe relates to Mahabhutic composition only. The multitudes of the human features are ascribed to the proportion of different Bhutas each of different nature. The balance of Dosha represents the healthy state and imbalance will cause various diseases. In normalcy Doshas will be performing their own functions and individual Doshas will be having their own specific sites. The word Vata derived from the verbal root ‘Va’ meaning is Gati and Gandhana. Vata is responsible for Gati (movement), Jnana (knowledge or perception) and Prapti(obtaining or receiving)6. Word meaning of Vata in derivation suggest the physiological functioning of Vata in the body in different dimensions.
Brief Physio-anatomical understanding of the vomiting reflex is necessary to understand physiological points emphasized in the derivation of Vata Dosha.

Vomiting is always preceded by nausea. Nausea is an unpleasant sensation which induces the desire for vomiting. It is characterized by secretion of large amount of saliva containing more amount of mucus. Strong involuntary movements in the GI tract which start even before actual vomiting. These movements intensify the feeling of vomiting. This condition is called retching (try to vomit) and vomiting occurs few minutes after this.

Act of vomiting involves series of movements that takes place in GI tract - Beginning of antiperistalsis, which runs from ileum towards the mouth through the intestine, pushing the intestinal contents into the stomach within few minutes. Velocity of the antiperistalsis is about 2 to 3 cm/second. Deep inspiration followed by temporary cessation of breathing. Closure of glottis, Upward and forward movement of larynx and hyoid bone, Elevation of soft palate, Contraction of diaphragm and abdominal muscles with a characteristic jerk, resulting in elevation of intra-abdominal pressure. Compression of the stomach between diaphragm and abdominal wall leading to rise in intragastric Pressure. Simultaneous relaxation of lower esophageal sphincter, esophagus and upper esophageal sphincter. Forceful expulsion of gastric contents (vomitus) through esophagus, pharynx and mouth. Movements during act of vomiting throw the vomitus (materials ejected during vomiting) to the exterior through nasal orifices; and through spinal nerves to diaphragm and abdominal muscles. Vata is responsible for Gati (movement), Jnana (knowledge or perception) and Prapti (obtaining or receiving).

Physiological importance emphasized in the word Prapti of Vata Dosha derivation can be understood as Receiving (Prapti) of the sensory stimulus by the sensory nerve endings present in the intestines. Physiological importance emphasized in the word Gamana of Vata Dosha derivation can be understood as Impulses from the nerve endings are transmitted via afferent fibers to the vomiting center, situated in medulla oblongata. The center in turn, sends motor impulses to the different parts of the gut via efferent nerve fibers. Physiological importance emphasized in the word Gnyana (knowledge, perception) of Vata Dosha derivation can be understood as Perceiving the impulses and generating the appropriate response by the vomiting center. Physiological importance emphasized with reference to motor part in the word Gamana of Vata Dosha derivation can be understood as Motor impulses from the vomiting center transmitted through V, VII, IX, X and XII cranial nerves to the upper part of GI tract; and through spinal nerves to diaphragm and abdominal muscles.

**AIMS AND OBJECTIVES**

To critically analyze physiology of vomiting reflex in Ayurvedic terms

**MATERIALS AND METHODS**

The Ayurvedic classics were scrutinized regarding the references for derivation of Vata Dosha. Later, physiologico-anatomical aspects of the vomiting with reference to reflexes were studied from modern physiology books. Later, supportive correlation was done between Ayurvedic and modern views to build valid and reliable hypothesis regarding derivation of Vata dosha in relation to the various anatomical and physiological aspects of the reflexes.

**DISCUSSION**

Sensory impulses for vomiting arise from the irritated or distended part of GI tract or other organs and are transmitted to the vomiting center through vagus and sympathetic afferent fibers. Vomiting center is situated bilaterally in medulla oblongata near the nucleus tractus solitarius. Motor impulses from the vomiting center are transmitted through V, VII, IX, X and XII cranial nerves to the upper part of GI tract; and through spinal nerves to diaphragm and abdominal muscles. Vata is responsible for Gati (movement), Jnana (knowledge or perception) and Prapti (obtaining or receiving).

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**CONCLUSION**

Physiological importance is emphasized in the word Gamana, Gnyana, Prapti mentioned in the derivation of Vata Dosha. Prapti refers to physiology of receiving the impulses from the stimulus and receiving the motor response by the effector organ. Gamana refers to movement of impulses from sensory nerve to defecation center and from vomiting center to effector organ. It signifies the motor response generated in gut. Gnyana refers to perceiving of the sensory impulses and generating appropriate response by the vomiting center.

**REFERENCES**


Source of support: Nil, Conflict of interest: None Declared