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# Understanding *Samaana Vaata* in relation to the physiology of digestion

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## ABSTRACT

*Ayurveda* is a way of life governed by the principle that whatever there is in the universe is there in the body also. The concept of *Tridosha* is one such theory which decides the well-being and the diseased condition of a human being. That is, when in equilibrium leads to health and when vitiated, leads to disease. *Vaata* being one of the *Tridosha* leads the other two *Dosha*, *Mala*, *Dhatus* as the wind carries the clouds in the sky. There are five types of *Vaata*, i.e., *Prana*, *Udana*, *Samana*, *Vyana* and *Apana*. *Samaana*, is situated near *Jatharagni* and moves all over the *Koshta*. The function of *Samaana Vaata* can be corelated with functions such as *Grahana*, *Pachana*, *Vivechana*, *Munchana*. The myenteric plexus, or plexus of Auerbach, is located between the longitudinal and circular smooth muscle layers of the muscularis in gastrointestinal tract. The motor neurons of these plexus mostly control GI tract motility (movement), particularly the frequency and strength of contraction of the muscularis. This can be co-related to *Karma* of *Samana Vata* like *Grahana*, *Munchana*. The submucosal plexus, also known as Meissner's plexus, is a network of autonomic motor nerve fibres located in the submucosa of the gastrointestinal tract. The motor neurons of the submucosal plexus supply the secretory cells of the mucosal epithelium, controlling the secretions and absorption of the organs of the gastrointestinal tract. This can be co-related to *Karma* of *Samana Vaata* like *Pachana*, *Vivechana.* Hence this article is aimed at further exploration of these anatomical and physiological aspects.

**Key words:** *Samaana, Vaata, Enteric nervous system, Agni.*

## INTRODUCTION

In the science of *Ayurveda*, *Desha* is told of two types, *Bhumi Desha* and *Deha Desha*. Implies, both the universe and the human body are governed by similar principles, macroscopically and microscopically respectively.[1]

Just as *Soma*, *Surya* and *Anila* support the body of world by functions like *Visarga*, *Aadana* and *Vikshepa* respectively, *Kapha*, *Pitta* and *Anila* support this human body.[2]

*Vaata* in its normalcy sustains all organs, assists mental activities, coordinates the sense organs, brings compactness in tissues, brings togetherness in body, and promotes speech, root cause of auditory and tactile sense faculties. Causes happiness and courage. Stimulates digestive fire and absorbs *Dosha*, throws out *Dosha* and *Mala*. Creates *Sthula* and *Anu Srotas*. Molds shape of the embryo. And promotes quality of life.[3]

In that, *Samaana Vaata* proximal to *Agni*, travels all around the *Koshta*, does functions as *Grahana* (taking), *Pachana* (digestion), *Vivechana* (differentiates into

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Sara and Kitta), *Munchana* (forward movement) of the ingested food.[4]

The digestive system consists of the gastrointestinal (GI) tract and the accessory digestive organs. The GI tract is a continuous tube that extends from the mouth to the anus through the thoracic and abdominopelvic cavities. The organs of the GI tract are mouth, most of the pharynx, oesophagus, stomach, small intestine, and large intestine.[5]

The processes of digestion are as follows,

1. Ingestion: Consumption of food and liquids through the oral cavity
2. Secretion: The wall of the GIT and accessory digestive organs secrete water, acid, buffer and enzymes into the GIT.
3. Mixing and Propulsion: The contraction and relaxation of the GIT mix the food and secretions. It also moves and stabilizes the digesting food particles into further organs of digestion as needed.
4. Digestion: Break down of ingested food into smaller molecules.
    a. Mechanically: By teeth, cutting and grinding of food into smaller pieces. Peristalses of intestines churn the food.
    b. Chemically: Digestion of macro carbohydrate, lipid, protein and nucleic acid molecules into smaller molecules.
5. Absorption: The intake of digested material through the epithelial cells lining the GIT and passing it into blood and lymph and distribute throughout the body. The undigested remnants of consumed food undergo further physiological processes.
6. Defecation: The essence less ruminants of ingested food are eliminated from the body through anal canal in the form of feces.[6]

## Aim

To explore the co-relation between *Samana Vaayu* and Enteric nervous system.

## Materials and Methods

Various classical texts, contemporary medical textbooks and previously done work.

## Review of Literature

The term *Samana* means "*Samanthad Kosthe Samyak Samam Vaa Aniti, Iti Samanah*", which denotes prevalent all around or which equalizes into one whatever we eat.[7]

*Sthaana* and *Karma* of the *Samana Vaata* according to different authors are as follows,

| Classical reference | ***Sthana* (situation)** | ***Karma* (function)** |
|---|---|---|
| *Charaka Samhita*[8] | Near *Swedavaha*, *Doshavaha* and *Jalavaha Srotas* | Assisting and giving strength to the *Antaragni* |
| *Sushrutha Samhitha*[9] | Moves in between *Aamashaya* and *Pakvashaya*, resides with *Agni* | Does digestion and segregation of *Aahara* |
| *Ashtanga Hrudaya*[10] | Near *Agni* (digestive fire), moves all over the *Koshta* | Does *Grahana* (taking), *Pachana* (digestion), *Vivechana* (differentiates into *Sara* and *Kitta*), *Munchana* (forward movement)of the ingested food |
| *Astanga Samgrah*[11] | *Kostha*, near the *Agni* circulates<br>*Dosha*, *Mala*, *Shukra* and *Artava*<br>*Vahi Srotas* | Holds food in the GI tract, digestion of food, separate into absorbable and non-absorbable portion and sends it further in the lower part of the intestine. |
| *Sharangdhara*[12] | *Naabhi* (Umbilical region) | Assists blood circulation |
| *Bhavaprakasha*[13] | *Koshta*, *Nabhi*, beside *Agni* | Digests and transports the food to the duodenum and separates its products. |

ISSN: 2456-3110 REVIEW ARTICLE March 2024

The tongue is supplied by the hypoglossal nerve. Pharynx is supplied by trigeminal and glossopharyngeal nerve, vagus nerve, and hypoglossal nerve.[14]

The enteric nervous system also known as the "Gut Brain" is composed of,

1. Myenteric plexus or Auerbach's plexus-
   - This outer plexus lies in between longitudinal and circular muscle layers.
   - Mainly controls gastrointestinal movements.
2. Submucosal plexus or Meissner's plexus-
   - This inner plexus lies in the submucosa.
   - Controls gastrointestinal secretion and local blood flow.[15]
3. Parasympathetic nervous system-
   - Supplies few fibers to mouth and Pharyngeal regions
   - Most fibers are entirely in vagus nerve - has extensive innervations to the esophagus, stomach, first half of intestine.
   - Both Increases the activity of the enteric nervous system.
4. Sympathetic nervous system
   - Innervates essentially all over the GIT.
   - Inhibits intestinal activity.

The two plexuses are interconnected with each other. The sensory nerve ending that originate in the gastrointestinal epithelium send afferent fibers to both plexus as well as to,

- Prevertebral ganglia of the sympathetic nervous system
- Spinal cord
- In the vagus nerves all the way to the brain stem.[16]

## DISCUSSION

The four *Karma* of *Samaana Vaayu* is similar to the six steps of digestive physiology.

### *Aahara Grahana*

Once the food is ingested through oral cavity, the voluntary and involuntary swallowing phases of food through pharynx and esophagus is done, this is can be understood as being the function of 5th, 9th, 10th,12th cranial nerve. The *Samana Vayu* brings the food near to *Agni* and also helps in the further process like digestion and assimilation. The various movements in the gastrointestinal tract viz. peristalsis, segmentation, and mixing movements of food to carry forward and secretion of gastric juices and enzymes which assist the digestion are done by *Samana Vayu*. Myenteric plexus or Auerbach's plexus of the enteric nervous system promotes and inhibits the movement of the GIT.

### *Aahara Pachana*

*Samana Vayu* stimulates *Pachak Pitta* hence both act as *Agni*. There are different juices and enzymes in our digestive system which helps in the digestion process for example pepsin enzyme which helps to digest protein, gastric juice main function is to inactivate swallowed microorganisms. Pancreatic juice Digestion of protein, carbohydrate and fat. Secretin enzyme that Stimulates pepsin secretion, pancreatic bicarbonate secretion, biliary bicarbonate secretion and inhibits gastric acid secretion. Pepsinogen enzyme that converts into pepsin for protein digestion etc. Which is controlled by Submucosal plexus or Meissner's plexus meanwhile Sympathetic and parasympathetic nervous system promotes and inhibits its activity.

### *Aahara Vivechana*

Once the food is digested, its transfer to various organs of the body is initiated. The gut wall absorbs the minute essence of food in the form of vitamins, minerals, and smaller absorbable units of lipids, proteins and complex carbohydrates. This is done into the local blood flow of the intestines. The watery component of the chyme is absorbed through the osmosis mechanism. All these Physiology is controlled by the Meissner's plexus. According to *Ayurveda* this is done by *Samana Vaayu* and the *Karma* is called as *Vivechana*.

ISSN: 2456-3110 REVIEW ARTICLE March 2024

### *Aahara Munchana*

After the physiology of absorption, the undigested essence less food is processed further into the proximal part of the large intestine surpassing the ileocecal junction for further steps of digestion. This accounts for the peristalsis of the colon. This motility is brought about by the Myenteric plexus, sympathetic and parasympathetic nervous system. According to Ayurveda this *Karma* is known as *Munchana* and is done by *Samaana Vaatha*.

## CONCLUSION

Though it is hard to pinpoint anatomical structures of the GIT to be the *Ayurvedic* equivalent of *Samaana Vaata*, the physiological aspect as well as the anatomy told in both the science can be corelated. The presence of structural component of Enteric nervous system in the GIT as well as the various aspects it controls in the process of digestion and the *Sthaana*, *Agni Sameepa* and *Karma* of *Grahana*, *Pachana*, *Vivechana*, *Munchana* are similar. In this way, we can say that the neurotransmitter activity in the gastrointestinal tract can be considered as the functions of *Samaana Vaata*.

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