



CRITICAL ANALYSIS ON ACTION OF VASTI: A REVIEW

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ABSTRACT:

Panchakarma is a very unique therapeutic procedure because of its preventive, promotive and rejuvenate properties as well as providing the radical cure. *Shodhana* is entity that is associated with the removal of *Mala* (morbid Doshas) from the body. Vasti is the most important Panchakarma chikitsa among all Panchakarma due to its multiple effects. Charaka has considered, Vasti chikitsa as Ardha Chikitsa of all the disease, while some authors consider it as the complete remedy for all the ailments. In modern medicine, enema is given only to remove the feces from the large intestine while in Ayurveda; Vasti is given as a treatment of systemic disorder. “Virya of the Vasti” spreads in the entire body to get desire action, through enteric nervous system (ENS) which is similar to brain.

Key words: Vasti, ENS (Enteric Nervous System), Veerya, Gut Brain, Gastrocolic Reflex.

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INTRODUCTION:

Panchakarma is a very unique therapeutic procedure because of its preventive, promotive and rejuvenate properties as well as providing the radical cure. *Shodhana* is entity that is associated with the removal of *Mala* (morbid Doshas) from the body. There are various toxins accumulated in the body due to defective removal which can be considered as a part of *Mala* or morbid *Doshas*^[1].

Vasti is the most important *Panchakarma* among the *Samshodhana* procedures. *Vasti* therapy has scope in all kind of ailments implicating different type of *Dosha*, *Dushya* and *Adhithana*. *Vasti* is supposed to be the principle (specific) treatment for *Vatika* diseases(A.H.Su.1/25).^[2] The *Poorva karma* of *Panchakarma* procedure brings the *doshas* from *Shakha* (whole body) to *Koshta* (intestine). *Vasti* eliminates *doshas* from the *Koshta* to the outside of the body through anal opening. *Vasti* therapy shows significant improvement in *Vatika* disorders. *Vasti* is the chief treatment of *Vatika* disorders and it is considered as the *Ardhachikitsa* (50% of all treatment modality) in *Ayurveda*.^[3] When *Vasti dravya* is administrated it reaches to *Pakwashaya*. The “*Veerya* (active principal) of the *Vasti*” spreads to the entire body may act through several mechanisms.

Vasti administered in the *Pakwashaya* affects the whole body by its *Veerya* similarly as the sun in the sky affects the *Bhurasas* (water) though it is far away.^[4] *Vasti Veerya* may act through enteric nervous system (ENS). The gastrointestinal system has a network of nerve fibres, which is known as ‘Enteric Nervous System (ENS). ENS (Enteric Nervous System) is substantial group of neurons, it is capable of Autonomous reflex without influence of central nervous system. More than 500 million neurons present in the ENS (Enteric Nervous System) so it’s called “second brain”.^[5] *Vasti* may act over the receptors of the ENS to stimulate the CNS causing secretion of required hormones or other chemicals. Gut brain (ENS) is located in the sheaths of tissue lining the oesophagus to colon. Considered a single entity, it is a network of neurons, possessing neurotransmitters and proteins that zap messages between neurons regulates functioning of body like those found in brain.

AIM AND OBJECTIVES:

1. This article reviews the critical analysis on action of *Vasti*.
2. The review on role of ENS (Gut brain) in action of *Vasti*.

MATERIALS AND METHODS:

This article is based on a review of *Ayurvedic* texts. Materials related to *Vasti* and other relevant topics have been collected. The main *Ayurvedic* texts used in this study are *Charak*

Samhita, Sushruta Samhita, Astang Sangraha, Astang Hridaya, Madhav Nidana and available commentaries on these. We have also referred to the modern texts and searched various websites to collect information on the relevant topics.

Review on organ relations on action of Vasti:

By definition itself, it is clear that assumption of mode of action of *Vasti* is more complicated. When *Vasti* is given, it will reach *Nabhipradesa, Kati, Parshwa, and Kukshi* region from these areas, the *Veerya* of *Vasti Dravya* reaches all over the body churn the *Dosha Samghata* and eliminate the vitiated *Doshas*. By facilitating these symptoms only, the *Vasti* is considered as *Samyakkrita Vasti*,^[6] relation to *Vasti Karma* are *Guda*,^[7] *Nabhi, Kati Parshwa, Kukshi* and *Vasti*.^[8] So we have to closely check the vitality organs which are responsible for making the *Vasti* as a unique one.

Nabhi:

It is considered as the *Mulasthan* of *Dhamani* and *Sira*.^[9] Just like water is transported through the stems of lotus, transportation of materials in the body takes place through *Sira* originating from *Nabhi*.^[10] Among 24 *Dhamanis*, 10 is said to supply above *Nabhi*, and 10 supplies below *Nabhi* and the last 4 go in *Tiryakmarga* and they split again and again as enumerable and spread throughout as a network.^[11] The given *Vasti* will reach first into

the organ named *Basti*.^[12] This organ is in direct relation with *Mushka, Seevani, Sthula Guda, Shukra and Mutra VahaNadi*.^[13] The organ related to *Kati, Parshwa, Kukshi* ^[14] may be the *Pakwasaya*. *Pakwasaya* extend from *Grahani to Guda*. It is the *Mulasthan* of *Pureeshavaha Srothas*.^[15] *Grahani* is considered as *Pitta Dhara Kala*. *Pitta Dhara Kala* is not different from *Majjadhara Kala* and *Pureesha Dhara Kala* is not different from *Asthidharakala*.^[16] So it is clear that *Vasti* has direct effect on *Asthi and Majja Dhatu*.

While we analyze each organ related to *Vasti*, we can understand that all of them are *Marmas. and Prana Sthana*.^[17] *Prana* here means *Agnyadi MahaBhoota*.^[18] More over the *Marmas* related to *Vasti* are *Sadhyapranahara Marmas. Sadhyapranahara Marmas* are *Agnimahabhootha* predominant.^[19] In *Marmas* four *siras* are (*Vatavahi, Pittavahi, Kaphavahi and Raktavahi*) present which help in the *Poshana of Snayu, Asthi, Mamsa* etc.^[20]

Colon – The principal site for action of Vasti dravya

Vasti is given through the anus. *Vasti dravya* present in the colon do not cross the ileocaecal valve it may reach up to ileocaecal junction. So, *Vasti dravya* remain present in the *Pakwashaya* (large intestine) which is the principal location of *Vatadosha*. The colon is about 1.5 m, rectum about 5 inches, anal column about 4 cm in length. Capacity when filled enema is 2 L of

volume, residual volume is 200 ml, and intracolonic volume is 750 ml. Enterogastric reflex and Colonoileal reflex helps to hold the Vasti for longer duration in case of *Asthapana Vasti* which is recommended empty stomach. The maximum time to hold the *Asthapana Vasti* is one *Muhurta* i.e., 45 minutes. The large intestine can absorb a maximum of 5 to 8 litres of fluid and electrolytes each day. Absorption can be accomplished by one of four mechanism which is Active transport, Passive diffusion, Facilitated diffusion & Pinocytosis or phagocytosis.

Importance of ingredients in emulsion

The main ingredients of *Vasti* includes *Saindhava*, *Makshika*, *Sneha*, *Kalka*, *Kwadha* and *Avapa*.

***Saindhava*:**

Sukshma Guna – It reaches upto micro channels of body.

Tikshna Guna - It break down the morbid *Mala* and *Dosha Sanghaa*

Snigdha Guna- Liquify the *Doshas*.

By its irritant property, it eliminates the *Vasti*.

Madhu

It forms the homogeneous mixture with *Saindhava*. *Madhu* has pre-digested sugar and it is easy to digest and readily absorbed by the body.

Sneha

Owing the *Snigdha guna* it produces unctuousness in body which in turn help for

easy eliminations of *dosha and mala*. *Sneha* increases permeability of cell membrane and become helpful in elimination of *dosha and mala*. Apart from these functions it also protects the mucus membrane from the untoward effect of irritating drugs in *Vasti dravya*.

Kalka, Kwatha and Avapa

These serve the functions of *Utkleshana or dosha harana or samana*. These are selected on the basis of *Dosha, Dushya and Srothas*. So their main action is *Samprapti Vighatana* of Roga⁽²¹⁾

Importance of empty stomach for *Asthapana Vasti* administration

Presence of food in the stomach develops a series of changes in the form of reflexes throughout gastrointestinal tract. It develops Gastrointestinal Reflexes into the stomach leads to the evacuation of the colon (the Gastrocolic reflex), results in evacuation and ultimately no retention of *Vasti dravya* in the colon.

When the *Vastidravya* administrated in empty stomach it does not develop gastro colic reflex and ultimately no evacuation of *Vastidravya* from the colon. *Vastidravya* administrated through anal route reaches to colon. Signals from the colon and small intestine inhibit stomach motility and stomach secretion (Enterogastric reflexes), and reflexes from the colon to inhibit emptying of ileal contents into the colon (Colonoileal reflex). Both Enterogastric reflexes and Colonoileal reflexes

helps in retention of *Vastidravya* in the colon for longer duration and helps to achieve its maximum effects. ⁽²²⁾ Therefore, *Asthapana Vasti* is recommended in empty stomach.

Effect of meal on AnuvasanaVasti

Anuvasana Vasti is advised to be given immediately after having meal is due to its less quantity. When food reaches to the stomach gastro colic reflex comes in action peristalsis develop in the colon. This physiology occurs inside the GIT. This is the time for administration of *Anuvasana Vasti*. Due to gastro colic reflex, it may reach up to splenic flexure i.e., distal colon. The main content of *Anuvasana Vasti* is oil, therefore it is denser and more viscous as compared to the *Niruha Vasti* therefore it does not travel for the longer distance due to its small quantity, increased viscosity and peristalsis. Due to *snigdha and ushna* property of oil it neutralizes the *ruksha and sheetaguna* of *vayu*. Usual duration of reverting back of *Anuvasana Vastidravya* is 3 Prahara (9 hrs).

Gastro intestinal reflexes

Role of Gastrocolic reflex

In empty stomach there is no distension in the wall of Gastrum and no development of gastro colic reflex. Gastro colic reflex is a facilitatory kind of reflex, presence of food in the stomach gives signal to colon for evacuation of content present in the colon hence *Vasti* will come out.

So, *Asthapana Vasti* is recommended in empty stomach

Role of Enterogastric reflex and Colonoileal reflex

Vastidravya should remain in the colon for one muhurta to attain its desirable effect. This aim is achieved by two reflexes, Enterogastric reflex and Colonoileal reflex. *Vasti* is given through anal route. *Vastidravya* may reach up to the proximal half of colon or up to the ileocaecal junction due to its volume and pressure gradient. Ileocaecal junction has ileocaecal valve. This valve allows only unidirectional movement of content from ileum to Caecum or colon. *Vastidravya* present in the colon do not cross the ileocaecal valve. So, *Vastidravya* remain present in the *Pakwashaya* (large intestine) the principal location of *vata dosha*. Administration of *Vastidravya* develops Enterogastric reflex due to stretching of the wall of intestine which in turn inhibits the stomach motility and its secretions. Colonoileal reflex also develops and inhibit the emptying of ileal contents in the colon. So, both these reflexes help to retain *Vasti* in the colon for a longer duration and to get the desirable effects. So, by these three reflexes *Vastidravya* remain in the colon for longer duration without developing evacuation reflex.

Role of ENS (Enteric Nervous System) on action of vasti

The gastrointestinal system has a network of nerve fibers, which is known as 'Enteric nervous system (ENS). Similar to brain ENS sends and receives impulses, record experiences and responds to various stimuli. Its nerve cells are bathed and influenced by same neurotransmitters. Gut brain (ENS) is located in the sheaths of tissue lining the oesophagus to colon. Considered a single entity, it is a network of neurons, possessing neurotransmitters and proteins that zap messages between neurons regulates functioning of body like those found in brain proper and a complex circle that enables to act independently, learn, remember and produce gut feeling. The gut contains 100 million neurons, more than that of in the spinal cord. Major neurotransmitters like serotonin, dopamine, glutamate, norepinephrine and nitric oxide are in the gut. Also, two dozen small brain proteins, called neuropeptides are there along with the major cells of immune system. The brain sends signals to the gut by talking to a small number of 'command neuron' which in turn sends signals to the gut interneuron that carry up and down. Both command neurons and interneurons are spread throughout the two layers of the gut tissue called 'myenteric plexus and the submucosal plexus. ENS works in synergism with the CNS. Stimulation with *Vasti* (either by chemo or mechano receptors) may lead to

activation of concerned part of CNS which precipitates result accordingly. Again it is not mandatory for a drug to stay in long time contact to the receptor e.g. like in Proton Pump inhibitor where drug interact and flush out from circulation, it is known as "hit and run module" of pharmacodynamics. Same module of pharmacodynamics may be hypothesized for Niruha Vasti. There is close resemblance in the functioning of Vata Dosha and nervous system and Vasti is prescribed as the best remedy for Vata. It again validates the efficacy of Vasti karma on nervous system. [23]

Chemical and mechanical stimulation:

Niruha Vasti is hyper osmotic solution which causes movement of solvent from cells of colon to the lumen containing *Vasti Dravya* facilitates the absorption of endotoxin and produce detoxification during elimination. *Kalka* used in the *Vasti* has got irritant property along with other ingredients which may induce colonic distention. The distention stimulates pressure which produces evacuatory reflex. The sigmoidal, rectal and anal regions of large intestine are considerably better supplied with parasympathetic fibers than other part of intestine; they are mainly stimulatory in action and function especially in defecation reflexes. A volume of about 100 cc of gas is estimated to be present in the tract which is readily expelled by *Vasti*. Even though the *Vasti* given is expelled out immediately as

such or mixed with feces, the *Veerya of Vasti* is spread throughout the body by the *Vata*⁽²⁴⁾ From this we can understand that the action of *Vasti* is possible through nervous stimulation

Nervous regulation of *Vastidravya*

When the *Vasti dravya* enters the colon, the autonomic nervous system comes in action due to distension of intestinal wall. Centres located in the spinal cord, brain stem and hypothalamus activates the autonomic nervous system. Also, portions of the cerebral cortex, especially of the limbic cortex, can transmit signals to the lower centres and in this way influence autonomic control. The autonomic nervous system also often operates by means of visceral reflexes. That is, subconscious sensory signals from a visceral organ can enter the autonomic ganglia, the brain stem, or the hypothalamus and then return subconscious reflex responses directly back to the visceral organ to control its activities. In this way the gut sends signals to spinal cord, brain stem, and hypothalamus and cerebral cortex which in turn do parasympathetic stimulation and hence muscarinic effect appear which relax the whole body. As long as the *Vasti* retained in the body parasympathetic tone remains dominant and hence the body feels relax and resting. *Vasti* is recommended in pathological condition of *Vruddhavata*. Sign and symptoms

of *Vruddhavata* is similar to the effect produced due to the increased sympathetic tone. *Vasti* increases the parasympathetic tone which nullifies the effect of increased sympathetic tone and brings it in homeostatic condition.

Spread of *Vasti Veerya* through *Vayu*

The *Virya* of given *Vasti* is immediately transferred to *Apana Vata*, from *Apana* to *Samana*, then to *Vyana* and then to *Udana* and then to *Prana*. Then the *Virya* reaches to *Pitta Sthana* and *Kapha Sthana* and bring them back to normalcy.⁽²⁵⁾ The *Virya* is carried in transverse direction by *Vyana vata*, descending direction by *Apana vata*, upward direction by *Prana vata* just like through channels water enters to field.⁽²⁶⁾ The *Virya* is carried by *Vata* through *Sira* and spread throughout the body.⁽²⁷⁾ The *Virya of Vasti* is taken upward by *Vata* then influences *Pitta sthana* and then *Kapha Sthana* and drag from their site.⁽²⁸⁾ In explanation of the above mechanism, *Vasti* treatment is given in aggravated vata conditions i.e., hyper action of all sub types of vata. All the five types of *vata* and its actions are exaggerated. *Vasti* helps to normalize all the subtypes of *vata* as it is the *Ardhachikitsa*. *Virya* of given *Vasti* is immediately transferred to *Apana Vata*. *Apana vata* helps to holds the *Vasti* in rectum through the inhibitory centres in the brain stem, located mainly in the Pons and cerebral

cortex⁽²⁹⁾ so that *Vasti* have sufficient time to do its effects on the whole body. *Vastidravya* in large intestine stretches the intestinal wall and activates the parasympathetic nervous system and secretion of acetylcholine (Ach). Ach stimulates the digestive secretions. Tone and peristalsis in the gastrointestinal tract are increased. Gastric secretions will also get increased. In this way *Vasti* helps in normalizing the aggravated function of *Samana vayu*. Then to *Vyana*, *Vyana vayu* controls the both somatic functions and autonomic functions. Acetylcholine helps to neutralize all the hyperactive functions by stimulating autonomic nervous system through Vagus nerve. About 75 per cent of all parasympathetic nerve fibres are in the Vagus nerves (cranial nerve X), passing to the entire thoracic and abdominal regions of the body. Stimulation of Vagus nerve causes secretion of Ach. Vagus nerve is inhibitory in nature. It gives supply to the heart the principal organ controlled by *Vyanavayu*. Hence, it controls and normalizes the Inotropic, Chronotropic, Dromotropic and Bathmotropic action of heart. Stimulation of Vagus nerve also helps to normalize all the hyperactive functions of *Udanavayu* like *VakPravriti* (speech), *Pryatan* (action), *Urja* (energy), *Smriti* (memory) etc. As the parasympathetic nervous system controls the hyperventilation, and intellectual factors that are the hyperactive functions of *Prana*

vayu. This helps to maintain normal homeostatic functions. Therefore, in this way *Vasti* shows its effect in all over the body.

DISCUSSION

In *Panchakarma Chikitsa*, individually *Vasti* is considered as half of the *chikitsa*. It is superior to other (*Virechana*, *Vamana*) *Shodhan karma* (bio purification therapies). The effect of *Vasti* is basically due to its *Shodhana* property that starts right from the *Pakwashayai*.e. Colon. *Shodhana* process is associated with the removal of *Mala and Doshas* from the body. Most of the authors in different articles have mentioned that *Vastidravya* can reach up to stomach and absorbed, some experts believe fat portion of *Vastidravya* gets absorbed from the mucosa of large intestine. Ileocaecal valve present in ileocaecal junction is a unidirectional valve. It always allows passing the materials only from Ileum to Caecum in response to Colonoileal reflex. *Vastidravya* neither cross the ileocaecal valve nor will reach to stomach and absorb. So, this hypothesis doesn't prove to correct and hence not accepted. Another misunderstanding is oil of *Vasti dravya* gets absorbed through the mucosa of large intestine. A valid objection of this hypothesis is that the oil portion of *Vasti Dravya* must be digested before its absorption. Mucosa of large intestine has tight junctions of epithelial cells. Bile is required for the emulsification of fat and pancreatic lipase

enzyme for digestion. Both bile and pancreatic digestive enzymes are secreted in the second part of duodenum. Fatty acids formed as a result of digestion must require bile micelles for absorption. Fatty acids are converted into triglycerides that are subsequently released in the form of Chylomicrons through the base of epithelial cells, to flow upward through the thoracic lymphatic duct and empty into circulating blood. The thoracic duct commences at the upper end of the cisterna chyli, on a level with the body of T12 vertebrae between the aorta and the Azygous vein. Blunt fat cannot be absorbed through the intestinal epithelial cells. So, this hypothesis doesn't prove to correct and hence not accepted. Stimulation of Enterogastric and Colonoileal reflexes and absence of Gastrocolic reflex are helpful to retain *Vasti* for the considerable period of time in *Niruha Vasti*.

Vasti may act over the receptors of the ENS to stimulate the CNS causing secretion of required hormones or other chemicals. Hence the effect of *Vasti* may also be associated with "Touch & Go Theory" causing activation of ENS receptors. Neurons in the gut are thought to generate as much dopamine as those in the head. Intriguingly, about 95 per cent of the serotonin present in the body at any time is in the ENS. Serotonin produced in the gut gets into the blood, where it is involved in repairing damaged cells in the liver and lungs. It is also

important for normal development of the heart, as well as regulating bone density by inhibiting bone formation.

CONCLUSION

Vasti dravya neither reach to the stomach, nor get absorbed through the mucosa of the large intestine. Volume or quantity of *Vastidravya* proportionately stimulates the muscarinic effects of Para sympathetic nervous system. Stimulation of Enterogastric and Colonoileal reflexes and absence of Gastrocolic reflex are helpful to retain *Vasti* for the considerable period of time. So, increased parasympathetic tone for 45 min shows the muscarinic effect throughout the body. Due to liquid nature of *Niruha Vasti* it dissolves the faecal matter in the intestine and causes defecation and removal of both *Vastidravya* and faecal matter. In case of *Anuvasana Vasti* Colonoileal reflex and volume of the *Vastidravya* helps to retain for a longer period of time. Presence of *Vastidravya* in colon inhibits emptying of ileal contents into the colon. *Anuvasana Vasti* normally revert back is 3 *Prahara* (9 hrs). Sodium chloride is an important content of *Anuvasana Vasti*. Absorption of Na⁺ and Cl⁻ causes secretion of bicarbonates from the mucosa of large intestine helps to neutralize the acidic end products of bacterial action in the large intestine. Although the Rectum is not a usual site for absorption of ingested nutrients, drugs introduced by rectum may be

absorbed here. *Vasti* acts through its *Veerya*. Active principles of the drug are generally considered as '*Veerya*.' The extent of rectal absorption has been reported to exceed oral values, which may reflect partial avoidance of hepatic first-pass metabolism after rectal delivery. ENS works in synergism with the CNS. Stimulation with *Vasti* (either by chemo or mechano receptors) may lead to activation of concerned part of CNS. The review of the studies done on *Vasti* helped in concluding that *Vasti* is effective in treating the diseases of all *Srotas* and especially *Vatavahasrotas*..

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