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Role of Apana Vata and Purishavaha Srotas in the Defecation Reflex: An Integrative review of the Enteric and Autonomic nervous systems

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Abstract:

Background: Defecation is a complex physiological process involving coordinated activity of the gastrointestinal tract, enteric nervous system, autonomic nervous system, and voluntary neuromuscular mechanisms. The initiation and regulation of the defecation reflex depend upon rectal distension, enteric neural pathways, parasympathetic outflow, and relaxation of anal sphincters. Modern physiology explains this process through intrinsic enteric reflexes mediated by the myenteric plexus and parasympathetic reflexes mediated through sacral spinal segments. Alteration in these regulatory mechanisms can result in disorders such as constipation, incomplete evacuation, and anorectal dysfunction. In Ayurveda, the process of fecal elimination is governed primarily by *Apana Vata*. *Apana vata* is one of the five subtypes of *Vata dosha*. It is located in *Apana desha* (Perineal region). It traverses along *Sroni* (Pelvis), *vasti* (urinary bladder), *medra* (external genital apparatus of each sex) and *uru* (thighs). It performs several vital functions, such as the expulsion of *Shukra* (Semen), *Artava* (menstrual blood), *Shakrit* (faeces), *mutra* (urine) and *Garbha* (the products of conception – foetus & Placenta). *Purishavaha Srotas* serves as the structural and functional pathway involved in the formation, transportation, and elimination of fecal matter.

Aim and Objective: To review and analyze the role of *Apana Vata* and *Purishavaha Srotas* in the physiology of the defecation reflex through an integrative understanding of the enteric and autonomic nervous systems**.**

Materials and Methods: A literature review was conducted using classical Ayurvedic texts, modern physiology textbooks, research articles, and databases such as Google Scholar and PubMed.

Conclusion: The functional attributes of *Apana Vata* and the structural-functional role of *Purishavaha Srotas* demonstrate notable similarities with the coordinated activities of the enteric and autonomic nervous systems involved in defecation. Although classical Ayurvedic concepts and modern neurophysiology describe bowel regulation from different perspectives, an integrative understanding may provide a broader insight into the physiology of the defecation reflex.

Keywords - Apana Vata, Purishavaha Srotas, Defecation Reflex, Enteric Nervous System, Autonomic Nervous System, Gut Motility, Neurophysiology, Ayurveda Physiology**.**

INTRODUCTION

Ayurveda describes the concept of *Tridosha—Vata, Pitta, and Kapha*—as the fundamental principle governing health and disease. Among them, *Vata Dosha* holds significant importance, as it regulates all types of movements and neurological functions, maintains structural integrity of the body, facilitates speech and sensory activities, and governs various physiological processes.[1]

Vata Dosha has five types: *Prana, Udana, Samana, Vyana, and Apana*, each governing specific bodily functions.[2] *Apana Vata* is one of the five subdivisions of *Vata* situated in *apana* region and is primarily responsible for the downward expulsion of *Purisha* (feces), *Mutra* (urine), *Shukra* (semen), *Artava* (menstrual blood), and *Garbha* (foetus and placenta).[3] Thus, it plays a crucial role in maintaining the normal physiological functions of the excretory and reproductive systems.

Among these functions, the elimination of *Purisha* is one of the Principal functions of *Apana Vata*. Ayurveda considers *Purisha* as one of the principal *Malas* of the body[4], and its proper elimination is essential for maintenance of normal bodily functions.[5]

The transportation and evacuation of *Purisha* are carried out through *Purishavaha Srotas*, whose *Moola* has been described as *Pakwashaya* and *Sthula Guda*.[6] Any disturbance in the normal functioning of *Apana Vata* may affect the activity of *Purishavaha Srotas*, leading to impairment of bowel evacuation and manifestation of disorders such as *Vibandha* and other anorectal diseases.[7] Therefore, *Apana Vata* serves as the primary physiological factor governing defecation in Ayurveda.

Modern physiology describes defecation as a reflex process involving coordinated activity of the colon, rectum, anal canal, pelvic floor muscles and nervous system. The process is initiated when fecal matter enters the rectum, producing rectal distension and stimulation of stretch receptors, which trigger the defecation reflex.[8]

The enteric nervous system (ENS) regulates gastrointestinal movements and secretions through two major plexuses, namely the myenteric (Auerbach's) plexus and the submucosal (Meissner's) plexus. The myenteric plexus primarily regulates gastrointestinal motility, whereas the submucosal plexus regulates secretory activity, absorption and local blood flow.[9] Because of its extensive neuronal network and ability to coordinate gastrointestinal activity independently, the ENS is often referred to as the intrinsic nervous system of the gastrointestinal tract.[10]

The autonomic nervous system further influences bowel activity through sympathetic and parasympathetic pathways. Parasympathetic stimulation facilitates intestinal motility and defecation, whereas sympathetic activity generally inhibits gastrointestinal movements.[11] The coordinated interaction of the ENS, ANS and anorectal musculature forms the physiological basis of the defecation reflex.[12]

The physiological actions attributed to *Apana Vata* exhibit similarities with the mechanisms governing defecation described in contemporary physiology. Likewise, the functional attributes *of Purishavaha Srotas* may be correlated with the large intestine and anorectal pathway involved in fecal transport and evacuation. Therefore, the present review aims to analyze the role of *Apana Vata* and *Purishavaha Srotas* in the Physiology of defecation and to correlate these concepts with the enteric and autonomic Mechanism involved in bowel evacuation.

MATERIALS AND METHODS:

The present review is based on a comprehensive study of classical Ayurvedic literature, including the *Brihattrayi* (Charaka Samhita, Sushruta Samhita, and Ashtanga Hridaya) and relevant references from the *Laghutrayi* (Bhavaprakasha, Sharangadhara Samhita), along with standard physiology textbooks, peer-reviewed scientific journals, and electronic databases. The collected literature pertaining to *Apana Vata*, *Purishavaha Srotas*, defecation reflex, enteric nervous system (ENS), and autonomic nervous system (ANS) was reviewed and analyzed to establish a conceptual correlation between Ayurvedic principles and contemporary physiological mechanisms of defecation.

REVIEW OF LITERATURE:

Apana Vata:

The word *apana* is derived from the root "*apa*" meaning "downwards". *Apana vata* is that which moves in the downward direction.[13] *Apana Vata*, one of the five subdivisions of *Vata Dosha*, is responsible for the elimination of *Shukra*, *Artava*, *Purisha*, *Mutra*, and *Garbha*. The elimination of waste products from the body is regulated primarily by Apana Vata in coordination with the other subdivisions of Vata.[14]

The location (*Sthana*) and physiological functions (*Karma*) of *Apana Vata* described in various Ayurvedic classics are presented in **Table 1**.

Table 1. *Sthana* (Location) and *Karma* (functions) of Apana Vata according to different Acharyas.

	Sthana(Location)	*Karma* (Function)
Charaka samhita[15]	*Vrishana* (testicles), *Vasti* (urinary bladder), *Medhra* (penis), *Nabhi*(umbilicus), *Uru* (thighs), *Vakshyana* (inguinal region) and *Guda*(anus)	Ejaculation, Micturition, defecation, expulsion of menstrual blood and fetus.
Sushruta samhita[16]	*Pakvadhana* (Large intestine)	Elimination of, *sakrit* (faeces), *mutra* (urine), *sukra* (semen), *garbha* (fetus), *artava* (menstrual fluid)
Ashtanga hridaya[17]	*Apana desha* (perineal region) and it traverses along sroni (pelvis), *vasti* (urinary bladder), *medhra* (external genital apparatus of each sex) and *uru* (thighs)	Expulsion of *sukra* (semen), *artava* (menstrual blood), *sakrit* (faeces), *mutra* (urine), and *garbha* (the product of conception that is fetus and placenta)
Ashtanga sangraha[18]	Rectum, moves along the urinary bladder, pelvis, penis, scrotum, and groin	Elimination of faeces, urine, semen, menstrual fluid and foetus
Sharangdhara[19]	*Malashaya* (Colon)	Elimination of faeces
Bhavaprakash[20]	*Pakswashaya* (Large intestine including rectum)	Expulsion of Flatus, faeces, urine, semen, foetus and menstrual blood downwards (out)
Bhela samhita[21]	*Pakwashaya*	Discharge of urine, faeces.

Purishavaha srotas:

The channels through which transportation of various *Sharira Bhavas* occurs, excluding *Sira* and *Dhamani*, are termed *Srotas*.[22] *Srotas* are described on the basis of their *Mulasthana* as well as abnormality occurring in that *Srotas*. *Mulasthana* means originating place.[23]

Purishavaha Srotas is composed of *Pakwashaya* and *Guda*.[24] In Charaka Samhita, *Sthula Guda* word is used. *Stula Guda* means three *Wali* of *Guda*. *Wali* means fold of skin.[25] These *Gudawali* are - *Pravahini*, *Visarjini* and *Samvarani*, Of the three folds the first from above downwards or innermost (*abhyantara*) is *Pravahini* that is responsible for straining to expel the faeces, next below it or middle (*Madhyama*) fold is *Visarjini* since it expels the faeces, the next below or third, *Bahya* – External is called *samvarani* since it constricts or closes the rectal orifice[26]. *Srotas* are responsible for formation and manifestation of respective *Sharirabhava*. Likewise, the formation and manifestation of *Purisha* takes place in *Purishavaha Srotas*. Finally, the excretion of *Purisha* occurs through *Guda* under the influence of *Apana Vata*. Thus, *Purishavaha Srotas* and *Apana Vata* function in close coordination to ensure the proper formation, transportation, and elimination of *Purisha*.

APANA VATA: MODERN PERSPECTIVE

Apana Vata is described through five principal functions, namely the elimination of *Shukra*, *Artava*, *Shakrit*, *Mutra*, and *Garbha*. Among these functions, the elimination of *Purisha* (feces) is of particular physiological importance. The downward movement and expulsion of *Purisha* attributed to *Apana Vata* may be understood in terms of the physiological mechanisms governing intestinal motility and defecation. The propulsion of fecal matter through the large intestine is facilitated by peristaltic activity, which is regulated by the enteric nervous system (ENS), particularly the myenteric plexus. Subsequent storage of fecal matter in the rectum and its eventual evacuation are mediated through the coordinated actions of the defecation reflex, autonomic nervous system (ANS), and anorectal musculature. Thus, the physiological processes responsible for the transport and elimination of fecal matter exhibit similarities to the functions described for Apana Vata. The following sections discuss these mechanisms with special reference to peristalsis, ENS, ANS, and the defecation reflex.

Enteric Nervous System

The gastrointestinal tract has a nervous system all its own called the enteric nervous system. It lies entirely in the wall of the gut, beginning in the esophagus and extending all the way to the anus. This highly developed enteric nervous system is especially important in controlling gastrointestinal movements and secretion. The enteric nervous system is composed mainly of two plexuses. An outer plexus lying between the longitudinal and circular muscle layers, called the myenteric plexus or Auerbach's plexus, and an inner plexus, called the submucosal plexus or Meissner's plexus, which lies in the submucosa. The myenteric plexus controls mainly the gastrointestinal movements, and the submucosal plexus controls mainly gastrointestinal secretion and local blood flow.[27]

Since gastrointestinal motility plays a central role in the propulsion of fecal matter and the initiation of defecation, the myenteric plexus assumes particular significance in understanding the physiological basis of these processes. Therefore, among the two major plexuses of the ENS, the myenteric plexus warrants special consideration in relation to bowel motility and defecation.

Myenteric plexus[28]

The myenteric plexus, also known as Auerbach's plexus, is situated between the longitudinal and circular muscle layers of the gastrointestinal tract and extends throughout its entire length. Owing to its strategic location, it is primarily concerned with the regulation of gastrointestinal motility. Stimulation of the myenteric plexus increases the tone of the gut wall, enhances the intensity and frequency of rhythmic contractions, and increases the velocity of conduction of excitatory waves, thereby facilitating the movement of intestinal contents.

The basic propulsive movement of the gastrointestinal tract is peristalsis, and effective peristaltic activity requires an active myenteric plexus. In the absence of a functional myenteric plexus, peristalsis is markedly reduced or maybe completely absent, indicating its essential role in the propulsion of intestinal contents. The myenteric plexus coordinates the sequential contraction and relaxation of intestinal smooth muscle, thereby generating peristaltic waves that move contents along the gastrointestinal tract.

A characteristic feature of peristalsis is its preferential propagation toward the anus. Although peristaltic waves may theoretically travel in either direction, they normally continue for a considerable distance in the anal direction while rapidly diminishing in the oral direction. This directional movement is attributed to the polarization of the myenteric plexus in the anal direction, ensuring the effective transport of intestinal contents toward the distal bowel.

Distension of the intestinal wall initiates the peristaltic reflex, also known as the myenteric reflex. In response to distension, a contractile ring develops proximal to the stimulated segment, while the distal segment undergoes receptive relaxation, facilitating the propulsion of contents in the anal direction. The peristaltic reflex together with the characteristic anal progression of peristaltic waves constitutes the "Law of the Gut." Thus, the myenteric plexus serves as the principal intrinsic neural mechanism responsible for the coordinated propulsion of fecal matter toward the anus, contributing significantly to the process of defecation.

ENS provides the intrinsic neural basis of defecation, but the intrinsic myenteric reflex alone is relatively weak and requires reinforcement from extrinsic autonomic pathways for effective bowel evacuation.

Autonomic Nervous System

Autonomic nervous system is concerned with regulation of visceral or vegetative functions. So, it is otherwise called vegetative or involuntary nervous system. Autonomic nervous system consists of two divisions, sympathetic division and parasympathetic division.[29]

The autonomic nervous system (ANS) regulates gastrointestinal activity through its parasympathetic and sympathetic divisions. Parasympathetic innervation enhances the activity of the enteric nervous system, thereby increasing gastrointestinal motility, secretion, and overall digestive function. The distal large intestine, rectum, and anal regions receive abundant parasympathetic innervation, which plays an important role in the regulation of bowel activity.

In contrast, sympathetic stimulation generally inhibits gastrointestinal function. It reduces intestinal motility and suppresses the activity of the enteric nervous system, thereby slowing the movement of contents through the gastrointestinal tract. Thus, the coordinated actions of the parasympathetic and sympathetic divisions of the ANS contribute to the regulation of gastrointestinal motility and function.

The major effects of both divisions on the gastrointestinal tract are summarized in **Table 2**.

Table 2. Actions of the sympathetic and parasympathetic divisions of the autonomic nervous system on the gastrointestinal tract[30]

	Sympathetic division	**Parasympathetic division**
Motility	Inhibition	Acceleration
Secretions	Decrease	Increase
Sphincters	Constriction	Relaxation
Smooth muscles	Relaxation	Constriction

Parasympathetic Nervous System

The parasympathetic defecation reflex is initiated when distension of the rectal wall stimulates stretch receptors, generating sensory impulses that travel to the sacral spinal cord through afferent fibers of the pelvic nerves. Reflex parasympathetic efferent signals are then transmitted back to the descending colon, sigmoid colon, rectum, and anus through the pelvic nerves. These impulses intensify colonic and rectal contractions, increase intrarectal pressure, and promote relaxation of the internal anal sphincter, thereby facilitating defecation. Voluntary relaxation of the external anal sphincter further permits the expulsion of feces. Thus, the parasympathetic defecation reflex reinforces the intrinsic enteric reflex and plays a crucial role in effective bowel evacuation.

Sympathetic Nervous System

The sympathetic nervous system plays an important role in the maintenance of fecal continence. Sympathetic fibers supplying the anorectal region inhibit rectal musculature and promote contraction of the internal anal sphincter, thereby preventing premature evacuation of fecal contents. In addition, sympathetic activity reduces colonic motility, facilitating the temporary retention and storage of fecal matter. Thus, the sympathetic division contributes primarily to continence and fecal retention rather than the active process of defecation[31]

Thus, the coordinated activities of the enteric nervous system, autonomic nervous system collectively facilitate the propulsion and evacuation of fecal matter, functions that closely resemble those attributed to *Apana Vata* in Ayurvedic literature.

PURISHAVAHA SROTAS: MODERN PERSPECTIVE

The *Purishavaha Srotas* has been described with *Pakwashaya* and *Sthula Guda* as its *Srotomoola*. From a modern perspective, these structures may be understood in relation to the anatomical components involved in the formation, storage, and elimination of fecal matter. *Pakwashaya* may be correlated with the large intestine, where fecal matter is formed and transported, while *Sthula Guda* may be correlated with the anorectal region, which participates in the initiation and execution of the defecation process. Thus, one component of *Purishavaha Srotas* is concerned with the formation and movement of *Purisha*, whereas the other is involved

in its expulsion through the coordinated mechanisms of defecation. The following sections discuss the rectum and anal canal in relation to these functions.

Rectum[32]:

The rectum is the terminal part of the large intestine situated between the sigmoid colon and the anal canal. It lies anterior to the sacrum and coccyx and terminates at the anorectal junction, where it continues as the anal canal. Unlike the colon, the rectum lacks the characteristic features of the large intestine such as sacculations, appendices epiploicae, and taeniae coli. Functionally, the rectum serves as a temporary reservoir for fecal matter prior to defecation. The lower part of the rectum, particularly the rectal ampulla, is capable of accommodating fecal contents, and its distension initiates the desire to defecate. Thus, the rectum plays an important role in the storage of feces and in the initiation of the defecation reflex.

The rectum receives both sympathetic and parasympathetic innervation through the superior rectal and inferior hypogastric plexuses. Sympathetic fibers inhibit rectal musculature and promote contraction of the internal anal sphincter, thereby contributing to fecal continence. In contrast, parasympathetic fibers stimulate rectal contractions and facilitate relaxation of the internal anal sphincter, promoting defecation. Sensations arising from rectal distension are primarily transmitted through parasympathetic pathways and are responsible for generating the conscious urge to evacuate the bowels. Therefore, the rectum serves as an important anatomical and functional component in the regulation of bowel evacuation.

Anal canal

The anal canal is the terminal segment of the gastrointestinal tract and extends from the anorectal junction to the anus. It serves as the final passage through which fecal matter is expelled from the body. The wall of the anal canal contains two sphincters that are essential for the maintenance of continence and regulation of defecation. The internal anal sphincter is composed of smooth muscle and functions under involuntary autonomic control, whereas the external anal sphincter is composed of skeletal muscle and is under voluntary somatic control.

The anal canal receives a complex nerve supply involving autonomic and somatic components. Parasympathetic fibers promote relaxation of the internal anal sphincter, while sympathetic fibers maintain sphincter tone and contribute to continence. The external anal sphincter is supplied by the pudendal nerve and remains tonically contracted under normal circumstances. Voluntary relaxation of this sphincter, together with relaxation of the internal anal sphincter and contraction of the rectal musculature, facilitates the passage of feces during defecation. Thus, the coordinated activity of the rectum, anal canal, and their neural control mechanisms ensures the proper regulation of continence and bowel evacuation.[33]

From a modern anatomical and physiological perspective, the large intestine, rectum, and anal canal collectively participate in the formation, storage, transportation, and elimination of fecal matter. These functions closely resemble those attributed to Purishavaha Srotas in Ayurveda. *Pakwashaya* may be correlated with the large intestine, where fecal matter is formed and propelled, while *Sthula Guda* may be correlated with the rectum and anal canal, which are responsible for storage and expulsion of feces. The coordinated actions of the enteric nervous system, autonomic nervous system, rectum, and anal sphincters facilitate bowel evacuation and reflect the physiological functions described for *Purishavaha Srotas* under the influence of Apana Vata.

Defecation

Defecation is a reflex phenomenon under voluntary control and therefore possesses both reflexive and voluntary components. The center for defecation is located in the sacral portion of the spinal cord and is influenced by higher centers. The efferent pathway of the reflex involves cholinergic parasympathetic fibers carried through the pelvic nerves.

The defecation reflex is initiated when mass peristaltic movements of the descending and sigmoid colon propel colonic contents into the rectum, resulting in rectal filling and distension. Stretch receptors located in the rectal wall are stimulated and convey afferent impulses to the sacral segment of the spinal cord through the pelvic nerves. Reflex responses arising from the sacral center are transmitted back to the rectum and internal anal sphincter through the pelvic nerves, while impulses to the external anal sphincter are conveyed through somatic nerves. Relaxation of the internal anal sphincter occurs due to inhibitory signals originating

in the myenteric plexus in response to a peristaltic wave approaching the anus, thereby allowing fecal matter to enter the anal canal.

Although the reflex mechanism facilitates defecation, the process is normally restrained by the acute anorectal angle and the tonic contraction of the external anal sphincter and puborectalis muscle. Since the external anal sphincter is supplied by somatic nerves, voluntary effort plays an important role in initiating defecation. In addition, higher centers, particularly the cerebral cortex, influence the spinal defecation center through corticospinal pathways, thereby providing conscious control over bowel evacuation.[34]

DISCUSSION

Apana Vata is one of the five subdivisions of *Vata Dosha* and is primarily responsible for the elimination of *Purisha*, *Mutra*, *Shukra*, *Artava*, and *Garbha*. Classical Ayurvedic texts consistently describe its action as downward moving and expulsive in nature. Among its various functions, the elimination of *Purisha* represents an important physiological activity related to the maintenance of normal bowel function. The review of classical literature demonstrates that *Apana Vata* governs the processes involved in the transport and evacuation of fecal matter. From a modern physiological perspective, these functions exhibit similarities with the mechanisms responsible for intestinal motility and bowel evacuation. Although *Apana Vata* cannot be directly equated with any single anatomical structure or physiological system, its functional attributes show notable resemblance to the coordinated mechanisms involved in the propulsion and expulsion of fecal matter.

The enteric nervous system, particularly the myenteric plexus, plays a central role in the regulation of gastrointestinal motility. The myenteric plexus coordinates peristaltic activity and facilitates the propulsion of intestinal contents toward the anus through the peristaltic reflex and the "Law of the Gut." A characteristic feature of this mechanism is the preferential anal progression of peristaltic waves, which ensures the effective movement of fecal matter toward the distal bowel. The autonomic nervous system further modulates this process. Parasympathetic stimulation enhances intestinal motility and reinforces the intrinsic enteric reflexes involved in defecation, whereas sympathetic activity contributes to continence by reducing motility and maintaining sphincter tone. Together, these neural mechanisms regulate the transport, retention, and eventual evacuation of fecal matter. The coordinated actions of the enteric and autonomic nervous systems may therefore be viewed as physiological mechanisms that facilitate the functions attributed to *Apana Vata*.

Purishavaha Srotas has been described with *Pakwashaya* and *Sthula Guda* as its *Srotomoola*. Classical descriptions indicate that *Purishavaha Srotas* is involved not only in the formation and manifestation of *Purisha* but also in its transport and eventual elimination under the influence of *Apana Vata*. From a modern perspective, *Pakwashaya* may be correlated with the large intestine, where fecal matter is formed and propelled, while *Sthula Guda* may be correlated with the anorectal region, including the rectum and anal canal, which participate in storage, sensory perception, and evacuation of fecal matter. The rectum functions as a reservoir whose distension initiates the desire to defecate, while the anal canal and its sphincters regulate continence and evacuation. These observations suggest a functional correspondence between the classical description of *Purishavaha Srotas* and the anatomical structures involved in bowel evacuation.

The defecation reflex represents an integrated physiological process involving rectal distension, activation of stretch receptors, intrinsic enteric reflexes, parasympathetic reinforcement, sphincter relaxation, and voluntary neuromuscular control. Effective defecation depends upon the coordinated interaction of these neural and anatomical components rather than the action of any single structure. In this context, Apana Vata may be understood as the functional principle governing the downward propulsion and expulsion of fecal matter, while *Purishavaha Srotas* may be viewed as the structural and functional pathway through which these activities are executed. Although direct equivalence between Ayurvedic concepts and modern physiological structures cannot be established, the present review highlights significant functional similarities between the classical descriptions of *Apana Vata* and *Purishavaha Srotas* and the contemporary understanding of the enteric nervous system, autonomic nervous system, and defecation reflex.

CONCLUSION

Apana Vata plays a pivotal role in the elimination of *Purisha* and is regarded in Ayurveda as the principal factor governing bowel evacuation. *Purishavaha Srotas*, with *Pakwashaya* and *Sthula Guda* as its *Srotomoola*, provides the structural and functional pathway for the formation, transport, storage, and expulsion of fecal matter. Modern physiology explains these processes through the coordinated actions of the enteric nervous system, autonomic nervous system, rectum, anal canal, and the defecation reflex. The myenteric plexus facilitates the propulsion of fecal matter through peristaltic activity, while autonomic pathways regulate bowel

motility, sphincter function, continence, and evacuation. The integrated sequence of rectal distension, neural reflexes, sphincter relaxation, and voluntary control ultimately results in defecation. Although direct equivalence between Ayurvedic concepts and modern physiological structures cannot be established, the present review demonstrates notable functional similarities between the actions attributed to *Apana Vata* and *Purishavaha Srotas* and the mechanisms involved in the defecation reflex. Further interdisciplinary research may contribute to a deeper understanding of these concepts and strengthen the integration of Ayurvedic principles with contemporary neurogastroenterological knowledge.

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