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Review Article

Rectal Drug Administration and Ayurvedic Basti Therapy: An Integrative Narrative Review

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Abstract

Background: Rectal drug administration remains a clinically valuable but relatively underutilized route in modern medicine. In Ayurveda, Basti therapy occupies a central therapeutic position, traditionally linked to the regulation of Vāta Doṣa and considered to exert systemic physiological effects.

Objective: This narrative review examines classical Ayurvedic descriptions of Basti alongside contemporary scientific understanding of rectal absorption, enteric neurophysiology, immune–neural interactions, and microbiota-driven signaling. The aim is to explore potential conceptual intersections and outline plausible mechanistic hypotheses relevant to integrative and translational research.

Methods: This narrative review integrates information from Ayurvedic classical texts (Saṃhitā), pharmacological literature, and recent biomedical research related to rectal drug delivery, mucosal physiology, neuroimmune communication, and gut microbiota–brain interactions.

Results and Discussion: Ayurvedic notions such as Srotas (physiological channels) and the regulation of Vāta show conceptual parallels that can be broadly compared with modern frameworks involving mucosal permeability, lymphatic and venous transport, and enteric nervous system (ENS) activity. Traditional Basti formulations, which combine honey, salt, lipids, and herbal decoctions, echo several principles of modern excipient design. Potential mechanisms by which Basti may exert systemic effects—though not yet experimentally confirmed for classical formulations—include ENS modulation, neuroimmune interactions, microbiota-mediated metabolite signaling, and lymphatic-assisted absorption. These interpretive bridges suggest that Basti-inspired strategies may offer translational value for designing hybrid rectal drug-delivery systems.

Conclusion: Rather than a simple cleansing procedure, Basti may be viewed as a structured therapeutic approach with conceptual relevance to modern transmucosal drug delivery. Further research should focus on standardized formulations, pharmacokinetic studies, hybrid formulation development, clinical evaluation, and regulatory considerations to facilitate meaningful translation into contemporary therapeutics.

Keywords: Rectal drug administration; Basti; Pañcakarma; Ayurveda; Enteric nervous system; Drug delivery systems

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Introduction

Rectal administration has long served as a practical alternative when oral delivery is limited or contraindicated, including in patients experiencing vomiting, seizures, impaired consciousness, or other conditions affecting swallowing.[1,2] The rectal route can provide both local and systemic effects, and because a portion of its venous drainage bypasses hepatic first-pass metabolism, certain agents may demonstrate enhanced bioavailability.

In Ayurvedic medicine, Basti (medicated enema therapy) is regarded as one of the five core treatments within Pañcakarma and is particularly emphasized for disorders associated with Vāta Doṣa. Vāta is described as governing movement, neural activity, circulation, and elimination.[3] The colon is traditionally considered the principal site of Vāta.[3,4] which underlies the longstanding rationale for Basti as a means of influencing systemic physiology.

This review seeks to position classical Ayurvedic insights alongside current biomedical understanding to explore how Basti may be interpreted within contemporary pharmacological and physiological frameworks. In this narrative review, we first outline the Ayurvedic foundations of Basti therapy, then summarize the contemporary physiology and pharmacology of rectal absorption and finally discuss potential clinical and translational applications in an integrative framework.

Ayurvedic Foundations of Rectal Administration

Therapeutic Significance of Basti

Ayurvedic classics, including the Carakasaṃhitā, place considerable emphasis on Basti as a primary modality for managing Vāta-related disorders.[3] These texts frequently describe Basti as having wide-reaching physiological effects, reflecting its perceived systemic influence. Suśruta and Vāgbhaṭa discuss Basti's action through Srotas—networks of channels that facilitate the transport of nutrients, waste, and other substances throughout the body.[5] Although framed in a traditional conceptual language, these descriptions can be broadly compared with contemporary notions of distribution pathways in the body.

Srotas and Colonic Physiology

The Pūriṣavaha Srotas, responsible for waste transport, is described as comprising the large intestine (Pakvāśaya), rectum (Guḍa), and associated structures. Its function is regulated by Apāna Vāyu, the downward-moving subtype of Vāta linked with elimination and reproductive functions.[6] These traditional

explanations can be broadly compared to contemporary understandings of colonic motility, fluid and electrolyte absorption, and mucosal barrier function.[7]

Agni, Vata, and Metabolic Regulation

Ayurvedic physiological models link effective digestion (Avasthā Pāka) with the interplay of Pācaka Pitta, Samāna Vāyu, and coordinated Vāta-driven motility.[8] Modern physiology similarly recognizes the roles of the enteric nervous system (ENS), endocrine signaling, and microbial fermentation in regulating digestive processes.[9] While the terminologies differ, the functional analogies provide a basis for interpretive mapping.

Mechanistic Logic of Basti

Classical texts often describe Basti using metaphors of irrigation and diffusion, suggesting an influence that extends beyond the colon.[3,4] The intended outcomes—such as normalization of Vāta, enhancement of digestive capacity, clearance of obstructed channels, and nourishment of tissues—have been interpreted as broadly mapping onto pharmacodynamic processes such as vascular distribution, lymphatic transport, and sustained systemic effects.[10]

Formulation Principles

Traditional Basti formulations combine honey (Madhu), rock salt (Saindhava), oil (Taila), and herbal decoctions (Kvātha) [11]. Each component contributes distinct properties, such as emulsification, improved permeability, or solubilization of actives. These practices show notable parallels to modern formulation strategies that employ surfactants, lipids, and vehicles to influence drug release and absorption.

Modern Physiology and Pharmacology of Rectal Absorption

Mucosal Architecture

The rectal mucosa comprises columnar epithelium with mucus-secreting cells and minimal enzymatic degradation capacity, accompanied by a near-neutral pH.[12] These features support the absorption of many compounds. Limited luminal fluid also permits prolonged contact between the administered formulation and the mucosa, enhancing uptake.

Venous Drainage and First-Pass Metabolism

Venous drainage from the superior rectal region enters the portal circulation, whereas the middle and inferior rectal veins drain into systemic circulation.[12] This arrangement permits partial evasion of hepatic first-pass metabolism for drugs absorbed in the distal rectum.

Lymphatic and Neural Transport

Certain lipophilic molecules may enter systemic circulation through rectal lymphatics, potentially offering an alternative pathway for absorption.[13] In parallel, the rectal region contains dense neural networks that form part of the ENS and autonomic nervous system, enabling rapid reflex signaling to distant organs.

Enteric Nervous System and Gut–Brain Signaling

The ENS functions as a complex neural system capable of coordinating gastrointestinal motility, secretion, and reflexes.[14] Its bidirectional communication with the central nervous system contributes to gut–brain interactions involving neurotransmitters, immune mediators, and hormonal signals.

Immune–Neural Crosstalk

Recent work highlights dynamic communication between enteric neurons and immune cells—particularly intestinal macrophages—which contributes to mucosal homeostasis and inflammatory responses.[15]

Microbiota-Derived Metabolites

Short-chain fatty acids produced through microbial fermentation exert influences on immune regulation, epithelial integrity, and neurochemical signaling.[16] These metabolites also participate in systemic pathways, including those that modulate metabolic and neuroimmune functions.

Clinical and Translational Applications

Therapeutic Advantages

Rectal delivery is particularly useful when oral administration is not feasible or when rapid therapeutic onset is desired. It has been utilized for anticonvulsants, analgesics, antibiotics, anti-inflammatory agents, peptides, and microbicides.[1,17–22].

Challenges

Variable absorption, differences in retention time, mucosal irritation, and patient comfort remain important considerations for rectal delivery [2]. These challenges would also be relevant when designing Basti-inspired hybrid formulations.[19]

Formulation Optimization

Critical determinants of rectal drug absorption include molecular size, ionization, lipophilicity, vehicle type, and retention duration.[19] The multi-component structure of traditional Basti formulations provides an interesting analogue to modern excipient strategies.

Integrative Insights: Ayurveda Meets Modern Science

Systemic Reach via Srotas

Ayurveda's notion of Srotas as systemic conduits [7] can be broadly compared with modern understanding of vascular, lymphatic, and neural

pathways.[15,20] This conceptual bridge has been used to interpret how Basti might influence distant organs—such as pelvic, renal, or central nervous systems—through ENS-mediated reflexes and systemic circulation.[24]

Disease Relevance

Classically, Basti is recommended for Vāta-associated conditions, which may, in contemporary terms, involve neural dysregulation, musculoskeletal disorders, metabolic imbalances, or urogenital dysfunction. Proposed modern interpretations include ENS modulation, lymphatic uptake of lipophilic agents, and SCFA-mediated metabolic influences.[25–27]

Immuno-Microbial Modulation

Possible pathways through which Basti may exert indirect systemic influences include modulation of gut-associated lymphoid tissue (GALT), changes in microbial community activity, and shifts in metabolite profiles such as SCFAs.[24, 28, 29]

Pharmacokinetic Strategies

Nirūha Basti (aqueous decoction–based) and Anuvāsana Basti (oil-based) may differ in their absorption profiles, reflecting mechanisms that could resemble rapid aqueous-driven uptake versus more sustained lipid-mediated delivery through lymphatic routes [20].

Discussion

This integrative review supports the view that Basti can be understood as more than a rudimentary enema and may be interpreted as a structured mode of systemic therapy within the Ayurvedic framework. Classical concepts—such as the dynamics of Srotas (Srotas), the use of multi-component formulations, and the regulation of Vata (Vāta)—can be discussed in relation to contemporary ideas involving mucosal permeability, ENS activity, neuroimmune interactions, and microbiota-mediated signalling.

Although the traditional mechanisms described in Ayurveda differ from biomedical terminology, several plausible points of convergence emerge. These include potential ENS modulation, immune–neural crosstalk involving intestinal macrophages and neurons, microbial metabolite signalling pathways, and pathways for vascular and lymphatic absorption.[30–33] These intersections offer a basis for exploratory development of hybrid rectal formulations that combine classical herbal preparations with modern delivery technologies.

Conclusion and Future Directions

Rectal administration via Basti represents an interesting point of convergence between classical Ayurvedic thought and modern biomedical science. By integrating Ayurvedic formulation

logic with contemporary pharmacokinetics and drug delivery principles, it may be possible to develop progressively evidence-based transmucosal therapies.

Key priorities for future work include standardized preparation of Basti formulations, controlled pharmacokinetic and pharmacodynamic studies of classical components, design of hybrid formulations combining traditional and modern technologies, and clinical trials targeting neurological, metabolic, immunological, and urogenital conditions. Additional priorities include comprehensive safety and toxicological evaluations for classical and hybrid rectal formulations and the establishment of appropriate regulatory frameworks.

Such translational research could help systematically evaluate Basti - inspired approaches as potential platforms for innovation in rectal drug delivery, grounding traditional insights in contemporary pharmacological and clinical evidence.

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References

1) de Boer AG, Moolenaar F, de Leede LG, Breimer DD. Rectal drug administration: clinical pharmacokinetic considerations. Clin Pharmacokinet. 1982 Jul-Aug;7(4):285–311. doi:10.2165/00003088-198207040-00002. PMID:6126289.
2) Hua S. Physiological and pharmaceutical considerations for rectal drug formulations. Front Pharmacol. 2019 Oct 16;10:1196. doi:10.3389/fphar.2019.01196. PMID:31680970; PMCID:PMC6805701.
3) Agniveśa. Carakasaṃhitā. Sūtrasthāna, Vātakalākalīyā-adhyāya, 12/8 [Internet]. Ayurveda360; cited 2025 Nov 25. Available from: https://ayurveda360.in/ebooks-esamhita-ecaraka-sutrasthana-vatakalakaleeya-adhyaya/

4) Agniveśa. Carakasaṃhitā. Sūtrasthāna, Kiyantaḥśirasīyā-adhyāya, 17/118 [Internet]. Ayurveda360; cited 2025 Nov 25. Available from: https://ayurveda360.in/ebooks-esamhita-ecaraka-sutrasthana-kiyantahshiraseeya-adhyaya/
5) Suśruta. Suśruta Saṃhitā. Cikitsāsthāna, Neṭrabasti-vyāpat-cikitsitam, 36/4 [Internet]. Ayurveda360; cited 2025 Nov 25. Available from: https://ayurveda360.in/ebooks-esamhita-esushruta-cikitsasthana-netrabastivyapat-cikitsa/
6) Agniveśa. Carakasaṃhitā. Śarīrsthāna, Śarīrasaṅkhyā-śarīram, 7/10 [Internet]. Ayurveda360; cited 2025 Nov 25. Available from: https://ayurveda360.in/ebooks-esamhita-ecaraka-shareeasthana-shareerasankhya-shareera/
7) Gupta S, et al. A review study of Pūriṣavāha Srotas w.s.r. to its modern perspective. Int Ayurvedic Med J. 2025 Oct; doi:10.46607/iamj3013102025.
8) Pandey K, Chaturvedi G, editors. Grahani Cikitsā Adhyāya, Charaka Saṃhitā. Varanasi, India: Chaukhambha Bhārati Academy; 2015. p.454.
9) Fleming MA 2nd, Ehsan L, Moore SR, Levin DE. The enteric nervous system and its emerging role as a therapeutic target. Gastroenterol Res Pract. 2020 Sep 8;2020:8024171. doi:10.1155/2020/8024171. PMID:32963521; PMCID:PMC7495222.
10) Auti SS, Ashok BK, Thakar AB, Shukla VJ, Ravishankar B. An experimental study to evaluate the pharmacokinetic aspect of Lekhana Basti (Emaciating/Desiccating Medicated Enema). Anc Sci Life. 2011 Oct;31(2):38–43. PMID:23284203; PMCID:PMC3530265.
11) Savrikar SS, Lagad CE. Study of preparation and standardization of 'Mādhutailika Basti' with special reference to emulsion stability. Ayu. 2010 Jan;31(1):1–6. doi:10.4103/0974-8520.68190. PMID:22131675; PMCID:PMC3215309.
12) Shafik A, Mostafa RM, Shafik I, Ei-Sibai O, Shafik AA. Functional activity of the rectum: a conduit organ or a storage organ or both? World J Gastroenterol. 2006;12(28):4549–4552. doi:10.3748/wjg.v12.i28.4549.
13) Trevaskis NL, Charman WN, Porter CJ. Lipid-based delivery systems and intestinal lymphatic drug transport: a mechanistic update. Adv Drug Deliv Rev. 2008 Mar 17;60(6):702–16. doi:10.1016/j.addr.2007.09.007. PMID:18155316; PMCID:PMC7103284.
14) Wood JD. Enteric nervous system: brain-in-the-gut. In: Physiology of the Gastrointestinal Tract. Elsevier; 2018. pp.361–372.
15) Wang H, Foong JPP, Harris NL, et al. Enteric neuroimmune interactions coordinate intestinal responses in health and disease. Mucosal Immunol. 2022;15:27–39. doi:10.1038/s41385-021-00443-1.
16) Parmar B, Arya R, Patel G. Harnessing probiotics: emerging strategies for health and disease management. Indian J Microbiol. 2025. doi:10.1007/s12088-025-01478-9.
17) American Academy of Pediatrics, Committee on Drugs. Alternative routes of drug administration—advantages and disadvantages. Pediatrics. 1997;100(1):143–152. doi:10.1542/peds.100.1.143.
18) De Conno F, Caraceni A, Zecca E, Spoldi E, Ventafridda V. Role of the rectal route in treating cancer pain: a randomized crossover trial of oral versus rectal morphine in opioid-naïve cancer patients. J Clin Oncol. 1995;13(4):1004–1008.
19) Niphade SR, Chaudhari VA, Bhusare SP. Opportunities for research in Basti Cikitsā: a critical review. Int J Res Ayurveda Pharm. 2025;16(1):153–155. doi:http://dx.doi.org/10.7897/2277-4343.16129.
20) Wu WM, Murakami T, Higashi Y, Yata N. Enhancement of rectal absorption of sodium ampicillin by N-acylamino acids in rats. J Pharm Sci. 1987;76(7):508–512. doi:10.1002/jps.2600760703.
21) Birnbaum AK, Kriel RL, Burkhardt RT, Remmel RP. Rectal absorption of lamotrigine compressed tablets. Epilepsia. 2000 Jul;41(7):850–853. doi:10.1111/j.1528-1157.2000.tb00252.x. PMID:10897156.
22) Yas A. Formulation and evaluation of diazepam as a rectal preparation. Tikrit J Pharm Sci. 2023;2:94–103. doi:10.25130/tjphs.2006.2.4.94.103.

23) Rathi R, Sanshita, Kumar A, Vishvakarma V, Huanbutta K, Singh I, Sangnim T. Advancements in rectal drug delivery systems: clinical trials, and patents perspective. Pharmaceutics. 2022;14(10):2210. doi:10.3390/pharmaceutics14102210.
24) Lou M, Heuckeroth RO, Butler Tjaden N. Neuroimmune crossroads: the interplay of the enteric nervous system and intestinal macrophages in gut homeostasis and disease. Biomolecules. 2024;14(9):1103. doi:10.3390/biom14091103.
25) Grampurohit PL, Rao N, Harti SS. Effect of Anuvāsana Basti with Kṣīrabalā Taila in Sandhigata Vāta (osteoarthritis). Ayu. 2014 Apr;35(2):148–151. doi:10.4103/0974-8520.146225. PMID:25558159; PMCID:PMC4279320.
26) Pal RK, Urmaliya N, Hardeniya P. Concept of Basti: an Ayurvedic and modern perspective. Int J Contemp Res Multidiscip. 2025;4(5):121–122.
27) Li Y, Zhang Y, Wei K, He J, Ding N, Hua J, et al. Review: Effect of gut microbiota and its metabolite SCFAs on radiation-induced intestinal injury. Front Cell Infect Microbiol. 2021 Jul 9;11:577236. doi:10.3389/fcimb.2021.577236. PMID:34307184; PMCID:PMC8300561.
28) Silva YP, Bernardi A, Frozza RL. The role of short-chain fatty acids from gut microbiota in gut–brain communication. Front Endocrinol (Lausanne). 2020;11:25. doi:10.3389/fendo.2020.00025.
29) Dalile B, Van Oudenhove L, Vervliet B, Verbeke K. The role of short-chain fatty acids in microbiota–gut–brain communication. Nat Rev Gastroenterol Hepatol. 2019;16(8):461–478. doi:10.1038/s41575-019-0157-3.
30) O'Riordan KJ, Moloney GM, Keane L, Clarke G, Cryan JF. The gut microbiota-immune-brain axis: therapeutic implications. Cell Rep Med. 2025 Mar 18;6(3):101982. doi:10.1016/j.xcrm.2025.101982. Epub 2025 Mar 6. PMID:40054458; PMCID:PMC11970326.
31) Park JC, Chang L, Kwon HK, et al. Beyond the gut: decoding the gut–immune–brain axis in health and disease. Cell Mol Immunol. 2025;22:1287–1312. doi:10.1038/s41423-025-01333-3.
32) Zhang H, Luan J, He L, Pan X, Zhang H, Li Y, Li H. Role of the gut-brain axis in neurological diseases: molecular connections and therapeutic implications (Review). Int J Mol Med. 2025 Nov;56(5):192. doi:10.3892/ijmm.2025.5633. Epub 2025 Sep 12. PMID:40937571; PMCID:PMC12440273.
33) Muller PA, Koscsó B, Rajani GM, Stevanovic K, Berres ML, Hashimoto D, et al. Crosstalk between muscularis macrophages and enteric neurons regulates gastrointestinal motility. Cell. 2014 Jul 17;158(2):300–313. doi:10.1016/j.cell.2014.04.050. Erratum in: Cell. 2014 Aug 28;158(5):1210. PMID:25036630; PMCID:PMC4149228.

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