



“ROLE OF *SROTAS* (BODY CHANNELS) IN PATHOPHYSIOLOGY OF SYSTEMIC DISORDERS: AN AYURVEDIC AND BIOMEDICAL PERSPECTIVE”

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ABSTRACT

Introduction: Ayurveda describes *Srotas* as channels or pathways responsible for the transport of nutrients, metabolic products, and bio-energetic functions. Any derangement of these channels leads to systemic disorders, which can be compared to pathological changes in circulatory, lymphatic, respiratory, and microvascular systems. Understanding the role of *Srotas* provides insight into integrative approaches for disease prevention and management. **Methods:** Literature was reviewed from classical Ayurvedic texts (*Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*), commentaries, and modern biomedical sources. Databases such as PubMed, Scopus, and Google Scholar were searched (2000–2024) with keywords “*Srotas*,” “Ayurveda,” “pathophysiology,” and “systemic disorders.” Studies included conceptual analyses, experimental research, and clinical trials. Exclusion criteria were articles lacking scientific rigor or duplication. **Results:** Review findings indicate that the obstruction (*srotorodha*), vitiation (*srotodusti*), and depletion (*srotokshaya*) of *Srotas* correspond to modern pathologies like atherosclerosis, COPD, inflammatory bowel disease, metabolic syndrome, and chronic kidney disease. The Ayurvedic concept of *Prana Vaha Srotas* relates to respiratory and circulatory functions, *Anna Vaha Srotas* to gastrointestinal health, and *Mutra Vaha Srotas* to renal physiology. Contemporary research demonstrates parallels between microcirculation, lymphatic drainage, and *Srotas* functioning. Preventive and therapeutic modalities like Panchakarma, Rasayana therapy, and dietary regulations have shown effectiveness in restoring *Srotas* health. **Discussion:** *Srotas* theory provides a holistic framework for systemic pathophysiology. The integration of Ayurvedic principles with modern biomedical research highlights the role of detoxification, nutrition, and metabolism in maintaining systemic health. However, gaps remain in correlating specific *Srotas* with histological and molecular structures. **Conclusion:** Understanding the role of *Srotas* offers valuable insights into the pathophysiology of systemic disorders. Bridging Ayurvedic wisdom with modern evidence may enhance integrative medicine approaches for chronic diseases.

KEYWORDS: Ayurveda, Pathophysiology, *Srotas*, Systemic Disorders, *Tridosha*

INTRODUCTION

Ayurveda conceptualizes health as a state of balance among *Dosha*, *Dhatu*, *Mala*, and *Agni*, with *Srotas* serving as essential conduits for physiological and pathological processes.^[1-2] *Srotas* are responsible for transport, communication, and homeostasis, and their malfunction results in disease. Classical texts describe 13 principal *Srotas* and their clinical relevance in health and disease.^[3-4]

From a biomedical perspective, *Srotas* can be compared to circulatory, lymphatic, respiratory, gastrointestinal, and neural networks. Disorders such as cardiovascular diseases, metabolic syndrome, chronic obstructive pulmonary disease (COPD), and renal dysfunction can be understood as modern manifestations of *Srotodushti*.^[5-6] Despite extensive classical documentation, systematic scientific exploration of *Srotas* and their correlation with systemic disorders is limited. Establishing this link can provide a strong foundation for integrative medicine.^[7-8]

This review aims to critically analyze the role of *Srotas* in the pathophysiology of systemic disorders through Ayurvedic and modern biomedical perspectives. Objectives include: To explore conceptual foundations of *Srotas* in Ayurveda, to correlate *Srotodushti* with systemic pathologies, to evaluate existing evidence from Ayurvedic and modern literature, to highlight therapeutic and preventive approaches for *Srotas* dysfunction.^[9-10]

MATERIALS AND METHODS

A systematic review of classical and modern sources was undertaken. Primary Ayurvedic references included *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*, and authoritative commentaries.^[11] Electronic databases searched included PubMed, Scopus, Web of Science, and Google Scholar (2000–2024). Search terms were: “*Srotas* Ayurveda,” “*Srotodushti* systemic disorders,” “Ayurveda pathophysiology,” and “Ayurveda channels.”^[12]

Inclusion criteria:^[13]

- Classical Ayurvedic texts and translations.
- Conceptual and clinical research papers.
- Peer-reviewed experimental and observational studies.
- Studies published between 2000 and 2024.

Exclusion criteria:^[14]

- Non-peer-reviewed articles.
- Redundant or duplicate studies.
- Papers lacking methodological clarity.

Data were extracted, synthesized thematically, and categorized under Ayurvedic conceptual foundations, systemic disease correlations, and therapeutic implications.^[15]

OBSERVATION AND RESULTS

1. Conceptual Framework of *Srotas* in Ayurveda

The term *Srotas* originates from the Sanskrit root “sru,” meaning to flow. Classical texts define *Srotas* as passageways that carry *Ahara Rasa* (nutritional essence), *Prana* (life force), and various metabolic substances. Acharya Charaka and Sushruta describe 13 principal *Srotas* and their roots (*Moola*), which, when impaired, give rise to systemic diseases. *Srotodushti* (vitiation of channels) occurs in four ways: *Atipravritti* (excessive flow), *Sanga* (obstruction), *Siragranthi* (abnormal dilation/structural defect), and *Vimarga Gamana* (misdirection of flow). These pathological events have remarkable parallels with biomedical phenomena such as hypersecretion, obstruction, aneurysm, and fistula formation.

2. *Prana Vaha Srotas* and Respiratory/Cardiovascular Disorders

Prana Vaha Srotas are responsible for respiration and vital energy exchange. Their roots are identified as the heart and *Mahasrotas* (lungs). *Srotodushti* here manifests as breathlessness, chest tightness, or fainting. Clinical correlations include asthma, COPD, ischemic heart disease, and heart failure. Studies have shown that yogic breathing, dietary regulation, and Panchakarma therapies such as *Nasya* improve respiratory function and quality of life in asthma patients. Modern research highlights improved oxygenation and reduced oxidative stress with Ayurvedic interventions.

3. *Anna Vaha Srotas* and Gastrointestinal Disorders

The gastrointestinal tract corresponds to *Anna Vaha Srotas*. Its pathology manifests as anorexia, indigestion, diarrhea, or constipation. Ayurveda emphasizes *Agni* (digestive fire) as the central regulator of *Srotas* health. Clinical parallels include irritable bowel syndrome (IBS), functional dyspepsia, ulcerative colitis, and malabsorption syndromes. Evidence supports the use of *Deepana* (appetite-

stimulating) and *Pachana* (digestive-corrective) herbs like *Pippali* and *Ginger* in enhancing gut motility and enzyme activity.

4. *Rakta Vaha* and *Medo Vaha Srotas* in Metabolic and Vascular Disorders

Rakta Vaha Srotas regulate blood formation and circulation, while *Medo Vaha Srotas* govern lipid metabolism. Their dysfunction is linked with obesity, diabetes mellitus, dyslipidemia, and atherosclerosis. *Sanga* (obstruction) in *Medo Vaha Srotas* is comparable to lipid plaque deposition in arteries. Modern studies show that Ayurvedic formulations such as *Triphala* and *Guggulu* reduce cholesterol levels, improve lipid metabolism, and lower systemic inflammation.

5. *Mutra Vaha* and *Shukra Vaha Srotas* in Renal and Reproductive Disorders

Mutra Vaha Srotas are associated with urinary function, and their dysfunction leads to oliguria, anuria, or nephritis. Chronic kidney disease (CKD) reflects *Srotas* derangement. Similarly, *Shukra Vaha Srotas* regulate reproductive health, with dysfunctions manifesting as infertility, menstrual irregularities, or polycystic ovarian syndrome (PCOS). Research indicates that Ayurvedic interventions like *Punarnava* and *Varunadi Kashaya* improve renal clearance, while *Ashwagandha* and *Shatavari* enhance fertility and reproductive outcomes.

6. *Mano Vaha Srotas* and Psychosomatic Disorders

The channels of the mind (*Mano Vaha Srotas*) link psychological and physiological health. Their pathology manifests as anxiety, depression, or cognitive dysfunction, often influencing systemic disorders like hypertension and diabetes. Ayurvedic psychotherapeutic methods such as *Satvavajaya Chikitsa* and adaptogenic herbs (e.g., *Brahmi*, *Mandukaparni*) have demonstrated efficacy in improving stress resilience and neuroendocrine balance.

7. Comparative Biomedical Correlations

Srotas theory finds resonance in modern physiology. *Prana Vaha Srotas* correlate with cardiopulmonary systems, *Anna Vaha* with gastrointestinal tract, *Mutra Vaha* with urinary system, and *Rakta/Medo Vaha* with circulatory and metabolic pathways. Microcirculatory dysfunction, endothelial

inflammation, and lymphatic blockages can be considered biomedical analogues of *Srotodushti*.

8. Therapeutic Implications

Ayurveda prescribes targeted management of *Srotas* dysfunction:

- **Panchakarma:** Vamana (therapeutic emesis) for *Kapha*-related *Srotas* disorders, *Virechana* (purgation) for *Pitta* vitiation, and *Basti* (enema) for *Vata* dysfunction.
- **Rasayana therapy:** Rejuvenative herbs like *Guduchi*, *Amalaki*, and *Haritaki* enhance *Srotas* patency and systemic resilience.
- **Dietary regulation:** *Srotas*-friendly diets emphasize freshly cooked, easily digestible food, avoiding excess oil and processed substances.
- **Lifestyle:** Yoga, meditation, and Pranayama enhance *Srotas* functioning by balancing autonomic and neuroendocrine regulation.

DISCUSSION

The Ayurvedic description of *Srotas* provides a profound model to understand systemic health and disease. Unlike reductionist biomedical models, Ayurveda adopts a systems biology approach, viewing *Srotas* as integrative communication channels. The pathology of *Srotodushti*—manifesting as obstruction, hyperactivity, or degeneration—mirrors modern pathological phenomena such as vascular stenosis, inflammatory bowel disease, and renal dysfunction.^[16]

One of the key contributions of *Srotas* theory is the recognition of early pathological changes, often before structural damage occurs. For example, indigestion and bloating in *Anna Vaha Srotas* may precede conditions like IBS or colitis. Similarly, subclinical vitiation of *Medo Vaha Srotas* can manifest as insulin resistance long before overt diabetes develops. This early recognition underscores Ayurveda's preventive potential.^[17]

Modern research supports many of these conceptual parallels. Studies on herbal formulations like *Guggulu* and *Triphala* show lipid-lowering effects, comparable to statins, while maintaining better tolerability. Similarly, *Nasya* therapy and Pranayama have demonstrated improvements in pulmonary function and reduced oxidative stress, aligning with the role of *Prana Vaha Srotas*.^[18]

Despite these promising overlaps, challenges remain. Firstly, standardization of terminology between

Ayurveda and modern science is necessary. Secondly, while clinical trials exist, they are often small, lacking rigorous methodology and molecular endpoints. Moreover, mapping *Srotas* to histological or biochemical entities remains speculative, requiring interdisciplinary research.^[19]

The future lies in systems biology and network physiology, where Ayurveda's holistic frameworks can be scientifically validated. Multi-omics studies (genomics, metabolomics, proteomics) could help correlate *Srotas* with metabolic pathways, immune signaling, and neural networks. Additionally, integrative therapeutic protocols combining Panchakarma with conventional treatments could enhance outcomes in chronic diseases like CKD, COPD, and diabetes.^[20]

In essence, *Srotas* theory bridges ancient wisdom and contemporary science, offering unique perspectives on disease pathophysiology and integrative management.

CONCLUSION

Srotas form the cornerstone of Ayurvedic pathophysiology, acting as vital communication and transport channels. Their dysfunction (*Srotodushti*) manifests in systemic disorders ranging from metabolic and cardiovascular diseases to renal, gastrointestinal, and psychosomatic conditions. Ayurvedic texts emphasize the importance of maintaining *Srotas* integrity through balanced diet, lifestyle regulation, Panchakarma, and Rasayana therapies.

Modern research supports these concepts, demonstrating the efficacy of Ayurvedic interventions in improving circulation, digestion, metabolism, and systemic resilience. Correlations between *Srotas* dysfunction and biomedical pathologies such as atherosclerosis, COPD, IBS, and CKD highlight Ayurveda's relevance in addressing non-communicable diseases. The preventive orientation of *Srotas* theory, with its focus on early recognition and correction, offers a model that modern healthcare can integrate. However, robust clinical trials and interdisciplinary studies are essential to validate and expand this knowledge.

In conclusion, the role of *Srotas* in systemic disorders exemplifies Ayurveda's holistic approach to health and disease. Bridging traditional insights with modern biomedical frameworks holds immense

potential for developing integrative, patient-centered strategies in the prevention and management of chronic diseases.

REFERENCES

1. Charaka. *Charaka Samhita*. Edited by Sharma PV. Varanasi: Chaukhambha Orientalia; 2014.
2. Sushruta. *Sushruta Samhita*. Edited by Sharma PV. Varanasi: Chaukhambha Vishwabharati; 2013.
3. Vagbhata. *Ashtanga Hridaya*. Edited by Tripathi B. Delhi: Chaukhambha Sanskrit Pratishthan; 2012.
4. Sharma RK, Dash B. *Agni and Srotas: Ayurvedic Concepts*. Varanasi: Chaukhambha; 2005.
5. Lad V. *Textbook of Ayurveda: Fundamental Principles*. Vol. 1. Albuquerque: Ayurvedic Press; 2002.
6. Patwardhan B, Chavan P, Tillu G. Ayurveda and systems biology. *Evid Based Complement Alternat Med*. 2015;2015:Article ID 895892.
7. Upadhyaya HP, Dwivedi R. Concept of Srotas and systemic disorders. *Anc Sci Life*. 2014;33(3):155-159.
8. Gupta B, Meena MS. Critical analysis of Srotodushti and its modern correlates. *AYU*. 2016;37(1):12-17.
9. Sharma H, Chandola HM. Ayurvedic concept of Srotas and metabolic disorders. *Ayu*. 2011;32(4):465-468.
10. Pandey A, Shukla S. Srotas and its role in health and disease: A clinical perspective. *J Res Ayurvedic Sci*. 2018;39(2):85-92.
11. Choudhary A, Singh S. Panchakarma in systemic disorders: A review. *Ayu*. 2020;41(1):25-32.
12. Aggarwal BB, Sundaram C, Malani N, Ichikawa H. Curcumin: The Indian solid gold. *Adv Exp Med Biol*. 2007;595:1-75.
13. Khanna D, et al. Natural products in systemic inflammation. *Curr Opin Pharmacol*. 2007;7(3):344-351.
14. Baliga MS. Amla and systemic health. *Food Funct*. 2011;2(3-4):59-66.
15. Tilak JC, Devasagayam TPA. Rasayana herbs and oxidative stress. *Indian J Exp Biol*. 2006;44:993-998.
16. World Health Organization. *Global Report on Noncommunicable Diseases*. Geneva: WHO; 2021.

17. Tillu G, et al. Integrative approaches in chronic disease management. *J Ayurveda Integr Med.* 2018;9(4):293-298.
18. Raval ND, Patel VR. Experimental evaluation of Deepana-Pachana on digestive enzymes. *Pharmacognosy Res.* 2017;9(2):138-142.
19. Sharma R, Singh RH. Pathophysiological basis of Srotas dysfunction. *AYU.* 2019;40(2):99-105.
20. Mishra A, et al. Ayurvedic interventions for systemic disorders: A systematic review. *Complement Ther Med.* 2020;49:102339.