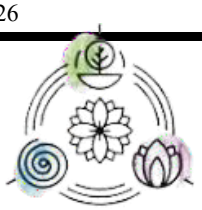
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Review Article

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"SROTAS SHARIRA: STRUCTURAL AND FUNCTIONAL CONCEPTS AND RELEVANCE TO MODERN SYSTEMS BIOLOGY"

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ABSTRACT

Background: Srotas are the channels or systems of transport and transformation in the Ayurvedic body. Their number, structure and disorders are described in the Samhitas, and the concept is used to explain the spread of disease and the action of treatment. **Objective:** To review the classical concept of srotas, the types described, the causes of their disorders (srotodushti), and to consider their relevance to current ideas in systems biology and clinical research. **Methods:** Classical texts were read in translation. PubMed was searched in November 2026 for papers on srotas, Ayurveda and related concepts. **Results:** The Charaka Samhita lists thirteen principal srotas (pranavaha, annavaha, udakavaha, rasavaha, raktavaha, mamsavaha, medovaha, asthivaha, majjavaha, shukravaha, mutravaha, purishavaha and svedavaha), with additional channels for women and for the mind. Disorders arise through four mechanisms: atipravritti, sanga, siragranthi and vimargagamana. Recent work uses srotas to explain hypertension, COVID-19 pathophysiology and metabolic heterogeneity. **Conclusion:** Srotas are best treated as functional transport and transformation networks that include, but are not limited to, anatomical channels. They may offer a useful scheme for describing systemic pathology and for generating hypotheses in systems biology.

KEYWORDS: Ayurveda, Srotas, Srotodushti, Sanga, Circulation, Systems biology, Ama

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INTRODUCTION

The Charaka Samhita states that the body is a collection of srotas and that all the dhatus are formed and nourished through them. The Samhita defines srotas as the channels through which the dhatus undergoing transformation are carried, and the health of the person depends on their patency (Ch. Vi. 5)[1]. The concept has been used in the discussion of nutrition, circulation, excretion and disease spread, but its meaning is debated, because the texts use the term for both visible tubular structures and invisible functional systems. A modern paper on tissue nutrition notes the role of channels in the kedari-kulya nyaya, in which nutrients reach tissues through a system of channels, and recent clinical papers use the srotas as an explanatory tool[2-4]. This review sets out the classical concept and evaluates its use.

MATERIALS AND METHODS

The Srotovimana of the Charaka Samhita (Vimanasthana chapter 5), the Sushruta Samhita, and the Ashtanga Hridaya were read in translation[1,5,6]. PubMed was searched in November 2026 using the terms Ayurveda, srotas and related words. Relevant indexed papers on the use of the concept in physiology and clinical conditions were reviewed[2-4,7].

OBSERVATION AND RESULTS

1. Definition and number of srotas

Srotas are defined by their function: they carry the substances undergoing transformation and the products of metabolism to and from the tissues. Charaka describes thirteen principal srotas in the Vimanasthana: those of prana (respiration), food, water, rasa, rakta, mamsa, meda, asthi, majja, shukra, mutra, purisha and sweda. For women, he adds the channels for breast milk (stanya) and menstrual blood (artava), and the mind is associated with the manovaha srotas (Ch. Vi. 5/7; Ch. Chi. 28)[1]. The Sushruta Samhita has a related list but it describes eleven pairs of channels (Su. Sha. 9)[5]. The two texts differ in emphasis, with Sushruta describing the structure in the context of surgery and anatomy, and Charaka stressing physiology and disease.

2. Root and course

Each srota has a mulasthana, or root, which is the organ or site that is functionally critical to it. For example, the roots of pranavaha srotas are the heart and the great channels, those of annavaha srotas are the stomach and the left side of the body, and those of rasavaha srotas are the heart and the ten vessels (Ch. Vi. 5/7)[1]. The concept of the root is physiological and indicates where an injury is most likely to produce a defect in the function of that system. It also guides treatment, since therapy is directed at the root.

3. Srotodushti: how channels go wrong

The Samhita identifies four types of abnormality: atipravritti (excessive flow), sanga (obstruction), siragranthi (nodule formation) and vimargagamana (flow in the wrong path) (Ch. Vi. 5/24)[1]. The causes are the same as those of the vitiation of doshas, including inappropriate diet, activities and seasons. Obstruction by ama or vitiated doshas is central, and the principle that srotas should be cleared before the dhatus can be restored underlies several treatments, such as pachana and shodhana[1,6]. A clinical interpretation of hypertension proposes that the occlusion (avarana) of vata by pitta and kapha in the rasa and rakta dhatus hampers the function of the corresponding srotas of circulation, and that the disease should be understood as a stage of spread (prasara) of the vitiated doshas[3].

4. Srotas in systemic disease

Pandkar and Sachdeva have used the srotas to describe the pathophysiology of COVID-19, linking the fever and respiratory involvement to the disorder of pranavaha srotas, and the later secondary effects, such as coagulopathy, cardiovascular and renal complications, to the involvement of the raktavaha and other srotas, with the abnormal immune responses interpreted in terms of rasa, rakta and ojas[4]. In a perspective on response to GLP-1 therapy, srotas are listed with agni and ama as constructs that could guide the identification of metabolic phenotypes[7]. These works do not prove that the srotas correspond to defined structures, but they show the use of the concept as an organising scheme for multi-system disease.

5. Relevance to systems biology

Systems biology considers the organism as a network of interacting components, in which disease arises from the failure of regulation or transport between components. The srotas scheme is similar in several respects: it describes systems of transport and transformation, locates their points of control (roots),

classifies the types of failure, and relates local abnormalities to systemic disease. A conceptual benefit is that it focuses on flow and obstruction as general features of pathology, and not only on the structure of organs. A critical review should note, however, that identifying srotas with defined modern structures, such as the vascular or lymphatic system, is a simplification and that the classical texts include channels that have no anatomical correlate in the modern sense.

DISCUSSION

The use of srotas has two major strengths. The first is that it connects physiology, pathology and treatment. The second is that it uses a limited number of failure modes to describe disease in many systems. A major weakness is the lack of agreed operational definitions: it is not clear which clinical or laboratory findings would indicate obstruction of a given srota, nor how this could be distinguished from the doshic and dhatu changes with which it is associated. Without such definitions, claims about the srotas cannot be tested. A practical step would be to develop structured clinical criteria for srotodushti of the main channels, to examine the reliability of their assessment, and to examine whether they predict outcomes of treatment.

CONCLUSION

The srotas form a set of functional systems that provide a general scheme for transport, transformation and obstruction. Their present value lies in conceptual organisation and hypothesis generation in the study of systemic disease. Their development as a research tool depends on operational definitions and validation against measurable physiology.

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