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An *Ayurvedic* Perspective on Blood Circulation: Role of *Vyana Vayu* and *Prana Vayu*

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ABSTRACT

Background: The *Tridosha* theory is used by *Ayurveda*, an ancient Indian medical discipline, to explain the physiological processes of the human body. *Prana Vayu* controls breathing and heart function, while *Vyana Vayu* is in charge of the circulation of *Rasa* (plasma) and *Rakta* (blood). Knowing their functions gives important information about cardiovascular health.
Objective: The purpose of this research is to examine *Ayurvedic* blood circulation theories, contrast them with contemporary cardiovascular physiology, and emphasise their practical applicability in the treatment of cardiovascular disease.
Methods: Classical *Ayurvedic* classics such as *Ashtanga Hridaya*, *Sushruta Samhita*, and *Charaka Samhita* were thoroughly reviewed. A comparative analysis of contemporary cardiovascular physiology literature was conducted. *Ayurvedic* physiology references from recent studies were used.
Results: *Vyana Vayu's* operations are consistent with contemporary ideas of vascular homeostasis, microcirculation, and systemic circulation. Similar to the autonomic nerve system, *Prana Vayu* controls breathing, heart function, and the neural regulation of circulation. Modern circulatory concepts are consistent with *Ayurvedic* descriptions of the heart, or *Hridaya*, and its function in circulation.
Conclusion: *Ayurvedic* blood circulation theories offer a complex framework that is in line with current cardiovascular research. A more comprehensive approach to cardiovascular health might be provided by incorporating *Ayurvedic* principles into contemporary cardiology.

Keywords: *Ayurveda*, *Vyana Vayu*, *Prana Vayu*, Blood Circulation, Cardiovascular System, *Rasa-Rakta Vikshepana*,

INTRODUCTION

Because blood circulation ensures the movement of oxygen, minerals, and metabolic waste, it is essential to maintaining life. This function is explained by *Ayurveda* using the *Vata Dosha* regulation mechanisms, specifically *Vyana Vayu* and *Prana Vayu*[1]. *Ayurvedic* scriptures' idea of *Rasa-Rakta Vikshepana* is comparable to current physiology's understanding of systemic circulation[2]. The physiological functions of *Vyana Vayu* and *Prana Vayu* are examined in this essay, along with how they relate to current cardiovascular research.

Aim and Objectives-

- To explore the *Ayurvedic* concepts of blood circulation concerning *Vyana Vayu* and *Prana Vayu*.
- To correlate *Ayurvedic* descriptions of circulation with modern physiological understanding.
- To highlight the clinical relevance of *Ayurvedic* principles in managing Cardiovascular health.

MATERIALS AND METHODS

This study is based on a comprehensive review of classical *Ayurvedic* texts and modern scientific research. The primary sources include *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya*. Secondary sources comprise modern research on Cardiovascular physiology and *Ayurvedic* physiology comparisons.

Site and functions of *Prana Vayu*

Acharya	**Site**	**Functions**
Charaka Samhita [3]	vertex, thorax, trachea, tongue, mouth and nose	spitting, sneezing, eructation, respiration, deglutition
Sushruta Samhita[4]	The *Vayu* which moves inside the mouth is known as *Prana Vayu*	helps in deglutination and sustains the functions of *Prana*
Asthanga Hridaya[5]	located in *Murdha* and it traverses along *Uras* (thorax), and *Kantha* (throat)	it maintains the proper functioning of *Budhhi* (intelligence/judgement), *Hridaya* (heart), *Chitta* (mind). It also performs functions such as *Sthivana* (spitting), *Ksavathu* (sneezing), *Udgara* (belching), *Nisvasa* (respiration), *Annapravesha* (deglutination)
Asthanga Samghra[6]	*Prana* is situated in the head and moves in throat and chest.	It controls or maintains the intellect, sense organ, heart/brain, arteries (blood vessel), and functions of supporting, expectoration, sneezing, belching, breathing and swallowing of food
Sharangdhara Samhita[7]	the location of *Prana Vata* at *Nabhi*. After reaching the proximity of heart	it passes outside through the throat to consume nectar like substance called *Vishnupadamrita* (oxygen) from the external atmosphere. After consuming within no time through the same route it gets back into the body. This *Prana Vayu* maintains the entire body and nourishes the *Jiva* and *Jatharagni*

Role of *Prana Vayu* in Cardiovascular Influence-

The head and chest contain *Prana Vayu*, which regulates vital physiological processes like breathing, heart rate, and brain activity[8]. It facilitates the following:

1. Cardiac Rhythm Regulation: Similar to how the sinoatrial node starts a heartbeat, *Prana Vayu* sustains regular cardiac contractions[9].
2. Oxygenation and Circulatory Coordination: Promotes the best possible oxygen absorption and transportation, guaranteeing adequate tissue perfusion[10].
3. Autonomic Regulation of Blood Pressure: Regulates autonomic nervous system reactions, impacting heart rate and vascular tone[11].

Site and Function of *Vyana Vayu*:

Acharya	**Site**	**Function**
Charaka Samhita[12]	*Vyana* has swift movement and spreads all over the body	responsible for gait, flexion, extension, twinkling etc.
Sushruta Samhita[13]	*Vyana Vayu* occupies entire living body. It helps in circulation of *Rasa* throughout the body	responsible for sweating, blood circulation, and five type of movement like expansion, contraction upward, downward and oblique movements along with blinking and opening of eyelids

Astanga Hridaya[14]	*Vyana Vayu* located in *Hridaya* and it travels along the whole body with very high velocity.	All motor functions of the body such as *Mahajava* (rapid movement), *Gati* (movement), *Avakshepa* (flexion), *Utkshepa* (extension), *Nimesha* (closure of eyelid/ being not responsive to movement), *Unmesha* (opening eyelids/ staying responsive).
Astanga Sangraha[15]	located in heart moves all over the body with great speed	Responsible for movement, expansion, contraction, upward movement, downward movement, opening and closing of eyelids, yawning, feeling the tastes of food, clearing of the channels, causing the flow of sweat and blood, bringing the male reproductive tissue into the uterus, separating the nutrient portion and waste portion of the food (after its digestion) and supplying nourishment to all the *Dhatus*.

***Vyana Vayu's* Role in Blood Circulation –** *Rasa* and *Rakta* are constantly moving throughout the body in *Vyana Vayu*, which is said to be the most prevalent form of *Vata*[16]. Its key roles include:

1. *Rasa-Rakta Vikshepana* (Blood Distribution): Ensures the propulsion of blood from the heart to peripheral tissues and back [17].
2. *Aakunchana* and *Prasarana*[18] (Vasoconstriction and Vasodilation): Regulates vascular tone and blood pressure[19].
3. *Tiryaka Gaman*[20] (Microcirculation): Manages the flow of blood through capillaries, ensuring cellular nutrition.
4. *Asruk Sravana* [21] (Hemostasis and Coagulation): Supports clot formation and prevents hemorrhage.
5. *Sweda Sravana*[22] (Thermoregulation): Facilitates perspiration to regulate body temperature, linking circulation to homeostasis.
6. *Sroto Vishodhana*[23] (Cleansing of Circulatory Channels): Maintains vascular integrity, reducing the risk of endothelial dysfunction.
7. *Yoni-Shukra Pratipadana*[24] (Reproductive Circulation): Ensures adequate blood supply to reproductive organs.

Comparison with Modern Physiology

Ayurvedic concepts of circulation closely resemble modern cardiovascular physiology:

- *Rasa-Rakta Vikshepana* aligns with systemic circulation.
- *Hridaya's* role in blood flow corresponds to the heart's function as a central pump.
- *Aakunchana-Prasarana* reflects mechanisms of vasoconstriction and vasodilation[25].
- *Srotovishodhana* is similar to endothelial function in vascular health[26].
- *Prana Vayu's* regulation of heartbeat and respiration parallels the autonomic nervous system[27].

Correlation with Modern Circulation

The *Ayurvedic* descriptions of circulation align with various modern physiological mechanisms:

- *Vyana Vayu's* function of circulation corresponds to the Autonomic control of blood flow[28].
- *Prana Vayu's* influence on cardiac regulation is similar to central nervous system control over heart rate.
- *Hridaya's* function as the circulatory pump is consistent with modern concepts of cardiovascular physiology[28].

DISCUSSION

A well develop physiological model of circulation is presented by the *Ayurvedic* perspective. The functions of *Prana Vayu* and *Vyana Vayu* closely align with current medical theories of circulation. *Prana Vayu's* role in blood movement is consistent with the brain regulation of cardiovascular function, whereas *Vyana Vayu's* role is similar to systemic circulation and microcirculation. Validating these findings through controlled clinical trials could be the main goal of future study, especially in determining how *Ayurvedic* treatments affect endothelial health, vascular flexibility, and blood pressure.

CONCLUSION

Ayurveda uses the principles of *Vyana Vayu* and *Prana Vayu* to give circulation a thorough, holistic approach. These ideas are consistent with contemporary cardiovascular physiology, highlighting the relationship between homeostasis, movement, and control. It might be worthwhile to investigate the potential of *Ayurvedic* techniques like *Yoga*, *Pranayama*, and herbal remedies in preserving circulatory health.

Declaration by Authors

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