



Review Article

EXPLORING THE LINK BETWEEN *ATIVYAYAMA* (OVEREXERCISE) AND *SROTODUSTI*, WITH EMPHASIS ON *PRANAVAHA SROTAS*: A COMPREHENSIVE SCIENTIFIC ANALYSIS

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ABSTRACT

Vyayama, a specialized concept in Ayurveda, serves as both the cause and remedy for various illnesses. While physical exercise is beneficial, excessive engagement in it can lead to negative health outcomes. Over-exertion aggravates the *Vata Dosha*, which in turn affects the qualities of the channels (*Srotas*), making them *Ruksha* and *Khara*. Consequently, *Vyayama* becomes a primary factor in the disturbance of the channels *Pranavaha*, *Asthivaha*, and *Swedavaha Srotas*. Conversely, insufficient exercise disrupts the *Medovaha Srotas*.

The *Pranavaha Srotas* serves as the vital channel responsible for carrying *Vata*, especially *Prana*, which sustains the vitality of every cell. Disruption in the structure or function of this channel leads to illness. When exercise is excessive, it can lead to *Hridayoparodha* resulting in impairment of the primary site of action. This can manifest as acute conditions (as myocardial infarction) or chronic conditions (as *Shosha*). It's important to engage in exercise appropriately according to *Bala* and *Ritu* to preserve health. This article explores the scientific evidence supporting the notion that excessive exercise (*Ativyayama*) can disturb the balance of the body's channels, particularly the *Pranavaha Srotas*. It offers a thorough examination of the relationship between overexercise and channel disturbances, providing insights into potential risks and preventive measures.

INTRODUCTION

The science of Ayurveda, known as the "Science of Living," encompasses every aspect of life with the aim of curing and preventing diseases. To achieve this, Ayurveda emphasizes the concepts of *Trayopastambha*, *Dinacharya*, and *Ritucharya*. *Vyayama*, or exercise, is an essential regimen outlined in *Dinacharya*, serving both as a cause and remedy for ailments. It assesses the strength (*Bala*) of an individual^[1]. *Vyayama* primarily refers to physical exercise (*Deha Vyayama*) and should be tailored based on factors such as strength, age, season, gender, diet, and health conditions.

Excess exercise (*Ativyayama*) can lead to various diseases such as *Trishna*, *Kshaya*, *Prathamaka*, *Raktapitta*, *Shrama*, *Klama*^[2]. Excessive exercise (*Ativyayama*) disrupts the body's channels (*Srotas*), resulting in the manifestation of diseases. *Srotas*, the channels responsible for transporting materials required for tissue formation (*Dhatu*), play a crucial role in the body. According to Acharya Charaka, there are 13 types of *Srotas* that carry vital substances like energy (*Prana*), food (*Anna*), water (*Udaka*), 7 transforming tissues (*Dhatu*), and 3 waste products (*Mala*). Dysfunction of these channels leads to the accumulation of toxins (*Dosha Dushya Sammurchana*) and subsequent disease manifestation in the body.

Pranavaha Srotas holds the primary position among the body's channels. According to Chakrapani, *Pranavaha* refers to the channels responsible for carrying *Prana Vata*^[3], which generally transport *Vata* throughout the body. The main roots of this channel are located in *Hridaya* and *Maha Srotas*. Consumption of foods and adherence to regimens that mimic the

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qualities of the *Dosha* can lead to disturbances in these channels. Similarly, when aggravated *Dosha* affect the *Pranavaha Srotas*, it can lead to manifestations of disease such as increased or obstructed breathing, accompanied by pain and abnormal respiratory sounds^[4]. This study primarily focuses on diseases associated with breathing difficulties linked to the *Pranavaha Srotas* or its primary site of action with *Vyayama* as the causative factor. The article dives into a scientific investigation and analysis of *Ativyayama*, or overexercise, as a potential risk factor for channel disturbances, with particular emphasis on the *Pranavaha Srotas*.

MATERIALS AND METHODS

This is conceptual type of research. All sorts of references has been collected and compiled from various available Ayurvedic classics texts like Charak Samhita, Sushruta Samhita, Ashtanga Sangraha, Ashtanga Hridaya, Madhava Nidana and available commentaries on it. All matters are analyzed for the discussion and attempt has been made to draw some conclusions.

What is Vyayama?

Vyayama is an activity aimed at achieving stability and increasing strength, known as *Deha Vyayama*^[5]. It is a form of *Shrama*, *Mallakreeda* and is characterized by sweating, increased respiration, a sense of lightness in the body, and feeling a blockage in the chest region^[6].

Vyayama in Sroto Swasthya

1. The role of *Vyayama* in maintaining the health of the body's channels (*Srotas*) and its benefits are significant. When performed in accordance with rules and regulations in appropriate amounts, *Vyayama* promotes lightness, stability, tolerance to discomfort, and enhances efficiency in actions. It primarily reduces *Kapha Dosha* and enhances digestive fire (*Agni*)^[7], thereby contributing to the equilibrium of *Dosha* and *Dhatu*. To sustain homeostasis, maintaining balanced *Doshas*, *Agni* (digestive fire), and proper elimination of waste products, *Vyayama* should be performed adequately.
2. *Vyayama* serves as a mode of treatment in conditions of *Santarpanajanya Vyadhi* ^[8]
3. *Vyayama* is one among *Niragni Sweda*^[9], *Langhana*^[10], indicating its role in mitigating vitiated *Dosha*.
4. It is believed that when *Balavan* person engaging in *Snigdha Ahara*, appropriate *Vyayama* - nullifies the adverse effects of incompatible food and activities [*Viruddha*]^[11]. Therefore, *Vyayama* should be practiced correctly.

Dosha movement to Shakha due to Vyayama

- *Dosha* move to *Shakha* from *Koshta*- 1st reason told is *Vyayama* only. Chakrapani tells it's because of *Vyayama Kshobha* [discomfort]^[12].
- Arunadatta tells because of *Vyayama Kshobha*, *Shrama*, *Ushma*, *Teekshnata*- *Dosha* get *Chala* [moving] and *Shithila* [looseliness] *Avastha*. So, *Dosha* move to *Shakha* via *Sroto Mukha*.^[13]

Ativyayama and Srotodusti

- *Vyayama* should be done using *Ardha Shakti* in *Sheeta* and *Vasanta Kaala* by *Balavan* and less in other seasons. *Ativyayama* is a term rooted in Ayurveda, signifying the practice of excessive or immoderate exercise. The imbalance it creates within the body's channels, specifically the *Pranavaha Srotas*.
- *Ativyayama* leads to *Vata Prakopa* which increases its own *Guna*, *Karma*. Thereby increases same *Guna Karma* in *Shareera* which is *Srotomaya*, which may hamper *Srotas*'s physical or anatomical structure. This can be result in *Kha Vaigunya*.
- In *Amavata Nidana* also we get the reference that after *Snigdha Bhojana* when *Vyayama* is done, *Srotas* get *Abhishyandana* by *Dosha* and *Ama* get dislodged to *Shleshma Sthana* by *Vayu* by *Dosha* leads to *Amavata*^[14].

Ayayama and Srotodusti

Even *Ayayama* is the cause for *Medovaha Srotodusti*.^[15]

- When *Vayu* gets obstructed by *Meda* leads to *Sthoulya Samprapti*.
- When there is *Abadha Meda*, leads to *Prameha Samprapti*.

Table 1: Vyayama and Srotodusti in general

Srotas	Dusti Karana
Pranavaha	Ati Vyayama
Medovaha	Ayayama
Asthivaha	Ati Vyayama
Swedavaha	Ati Vyayama

Vyayama and Pranavaha Srotas

- *Pranavaha Srotas* serves as the pathway for transporting *Vata*, particularly *Prana Vata*, ensuring the distribution of energy to every cell. Each *Srotas* has its fundamental source, known as *Moola*, indicating the starting point [*Prabhava Sthana*]^[16] of its function rather than just its anatomical origin. In case of *Pranavaha Srotas*, *Hridaya* and *Maha Srotas* serve as *Moola Sthana*.
- Acharya Charaka highlights various factors contributing to the derangement of *Pranavaha Srotas*, including suppression of natural urges, consumption of dry foods, excessive physical activity, and engaging in strenuous tasks.

- These causative factors lead to characteristic symptoms such as increased, obstructed, shallow, or frequent respiration accompanied by sound and discomfort.
- The diseases because of *Vyayama dana* mainly associated with *Pranavaha Srotas* or its *Prabhava Sthana* are *Hikka, Shvasa, Rajayakshma, Kasa, Hridroga*.
 1. *Hikka* and *Shvasa - Pranavaha* is involved.^[17]
 2. *Rajayakshma* or *Shosha- Sahasa*^[18] can be considered under *Ativyayama*.
In *Samprapti*, because of *SrotoRodha* next *Dhatu* will not get nutrition and gets depleted. Even *Dhatooshma* gets decreased resulting in *Rajayakshma*.
 3. *Kasa* – Because of *Vata Prakopaka Nidana, Adhah Pratihata Vayu [Prana]* gets *Urdhva Gati* and enters *Urdhva Srota*^[19], comes through *Mukha*.
 4. *Hridroga-Kupita Dosh*a vitiate *Rasa* which is *Hridayashrita*.
- Furthermore, excessive mental stress, considered a form of mental exertion, can lead to disturbances in *Rasavaha*^[20] and *Manovaha Srotas*, both of which have their origin in the *Hridaya*. Symptoms of *Pranavaha Srotas* disturbance, such as increased breathing and a sensation of chest tightness, are also mentioned in conditions *Unmada* case.
- Intense physical activity increases the demand for oxygen by the heart muscle, shortening the time available for relaxation (diastole) and coronary artery perfusion. This scenario can lead to myocardial ischemia and dangerous cardiac rhythm disturbances termed as Exercise induced muscle damage [EIMD] and Oxidative Stress.^[21]
- Research indicates that oxidative stress is evident following muscle damaging exercise.^[22]
- EIMD is associated with muscle soreness or discomfort and a marked decline of muscle strength during the first 12–72 hours post-exercise.^[23]

The Impact on *Pranavaha Srotas*

Overexercise places immense stress on the cardiovascular and respiratory systems. This strain can lead to an inefficient transport of *Prana* and oxygen through the *Pranavaha Srotas*, resulting in their imbalance.

Symptoms of *Srotodushti*- Imbalance in the *Pranavaha Srotas* due to over exercise may result in various health issues, including:

DISCUSSION

- *Pranavaha Srotas* is intricately connected to the cardiovascular system, facilitating the distribution of oxygen to all cells. Exercise serves as a means to enhance physical and mental well-being, improve cardiovascular health, and promote overall health.
- *Ativyayama* encompasses not only excessive exercise but any activity that induces fatigue or exhaustion.

Table 2: Symptoms of *Srotodushti*

Cardiovascular Complications	Overworked heart muscles may lead to irregular heart rhythms, elevated blood pressure, and an increased risk of heart diseases.
Respiratory Challenges	Disrupted <i>Pranavaha Srotas</i> can cause shortness of breath, particularly during physical exertion, reflecting impaired oxygen transport.
Chronic Fatigue	Overtraining can lead to chronic fatigue syndrome, characterized by persistent tiredness and low energy levels.
Weakened Immune System	Excessive exercise can weaken the immune system, rendering the body more vulnerable to infections and illnesses.
Mental Health Implications	Overtraining can result in mood disturbances, anxiety, and depression, reflecting the strain on both the body and mind.

Preventing *Srotodushti* from Over exercise

It involves adopting a balanced approach to physical activity. Strategies to mitigate these risks include:

Periodization: Implement structured training programs that incorporate adequate rest intervals and varying levels of intensity to allow for recovery.

Proper Nutrition: Ensuring that nutritional needs are met, including macronutrients and micronutrients, is crucial for supporting the body during exercise and recovery.

Listening to the Body: Paying attention to signs of fatigue and overtraining such as persistent muscle soreness, mood changes, and sleep disturbances

Rest and Recovery: Incorporating rest days into the exercise regimen is essential for the body to repair and rejuvenate.

Consultation: Seeking guidance from healthcare providers or fitness professionals when concerned about exercise intensity or its impact on health can provide personalized recommendations and monitoring

CONCLUSION

Exercise plays a crucial role in a healthy lifestyle, it's important to maintain a balance. Understanding the interplay between excessive exercise (*Ativyayam*) and *Srotodushti*, particularly in the context of *Pranavaha Srotas*, helps individuals make informed decisions about their exercise routines to minimize potential health risks. A holistic approach to exercise, complemented by proper nutrition, adequate rest, and self-care, is essential for overall health and well-being. Prioritizing health should always be the primary consideration when planning an exercise regimen, ensuring that the *Pranavaha Srotas* and other vital channels remain in harmony and equilibrium.

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