



# UNDERSTANDING MARGAVARANA THROUGH CONTEMPORARY SCIENCE: AN INTEGRATIVE EXPLORATION

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## ABSTRACT

*Ayurveda*, an ancient system of medicine, has long back recognized the impact of sedentary lifestyles and high-fat diets on health. In Ayurvedic literature, the concept of *Margavarana* is employed to describe the hindrance to *Rakta Marga*, the blood vessels. This obstruction arises from the accumulation of *Kapha* and *Medhas* in the *Rakta Marga*, leading to *DhamaniPrathichyaya* (thickening of the blood vessels) *DhamaniPushtatha*, (vascular remodelling) *VistharaBhava* (calcification deposit) and the formation of *SirajaGranthi* (atherosclerotic plaque). These entities give rise to various health conditions, including *Mutraoukasada* (thick urine disorder) *Vatavyadhi* (Nervous system disorder) and *Hrithshoola* (cardiac disorder) etc.

In the contemporary context, the repercussions of sedentary lifestyles and high-fat diets significantly contribute to the rising prevalence of dyslipidaemia. They, in turn, elevate LDL and total cholesterol levels while reducing HDL in the blood. Importantly, these factors are known precursors or concurrent developments with atherosclerosis. This article aims to provide a bridge between Ayurvedic insights and current medical understanding, enhancing clinical decision-making and the approach to patients.

**KEY WORDS:** *Margavarana*, Atherosclerosis

## INTRODUCTION

*Vayu* earns the title of *Vishwaroopa* due to its omnipresence throughout the universe, governing the entire *Shaareera* (bodily constitution) and maintaining its normal functioning condition<sup>1</sup>. Additionally, it is known as *Ayu* (duration of life) because, in both its *Prakrita Roopa* (normal function) and *Prakrita Stana* (normal location), *Vayu* is responsible for the overall well-being of individuals.<sup>2</sup>

*Vayu* undergoes *Prakopa*, or aggravation, either due to *Margavarana* (blockage of its circulatory channels) or *Dhatu Kshaya* (reduction of tissue components).<sup>3</sup> However, it's crucial to note that depending on the aetiology

and *Sthana* (place), *Vata Prakopa* can give rise to a myriad of diseases. Understanding the pathological process of *Margavarana* becomes essential in comprehending the diverse range of ailments associated with *Vata* aggravation.

### ***Margavarana***

The term "*Margavarana*" is a combination of two Sanskrit terms, "*Marga*" and "*Avarana*." Here, "*Avarana*" signifies obstruction, while "*Marga*" specifically refers to the *Rakta Marga* or the blood vessels. *Margavarana*, therefore, translates to the obstruction of the blood vessels. The accumulation of *Kapha* and *Meda* (fatty substance) in the *Rakta Marga* leads to two significant consequences: *Dhamani Prathichaya* and *Shonitabhishyandha*.

*Dhamani Prathichaya* means thickening of the blood vessels while *Shonitabhishyandha* refers to the hyperviscosity of blood. These processes collectively contribute to the development of *Margavarana* (blockage of circulatory channel) This *Margavarana* pathology becomes a pivotal factor in the manifestation of various ailments, which dependent on the affected area. The diverse range of conditions includes *Hridroga*, (cardiac pathology) *Vataraktha*, (Rheumatism disorder) *Gulma* (abdominal lump disorder), *Mutraukasada* (thick urinary disorder), and *Margavarana* *Vvata Vyadhi* (nervous system disorder)

## **MATERIALS AND METHODS**

### ***Shonitabhishyanda***

When person indulge in *Asathmya Ahara* (consumes food that is mutually incompatible), or *Asathmya Vihara* (when one engages in unwholesome activity) which results in *Prakopa* of *Kapha* and *Medha* which causes the obstruction to the *RaktaMarga* (circulatory channels) which in turn results in the development of *Shonitabhishyandha*. Here *Abhishyandha* refers to the development of *Mandakleda* in *Dosha Dhatu Mala* and *Srothas* Whereas *Shonitabhishyanda* refers to the development of *Mandakledata* in *Rakta Marga* which occurs either due to

### **1) *Santharpana Nidhana Janya***

When person constantly taking diet which increases *Kapha*, indulges in eating when the previously meal is undigested, avoids physical exercises and day sleeping, due to all these *Ahara Rasa* being undigested results in the development of *Ama* (excessive and unctuous substances) which circulate in the body and results in various *Santharpanajanya Vikara*.<sup>5</sup>

### **2) *Virudhaharajanya***

Intake of *Virudha Ahara* like combination of fish and milk because of their *Virudha Veerya* (mutually disagreeing) causes accumulation of *Kapha* and *Medha* in the *Rakta*.<sup>6</sup> This excess *Kapha* and *Medhas* in the *Rakta* causes the development of *Shonitabhishyandha*<sup>7</sup> which eventually causes *Dhamani Prathichyaya* (thickening of the blood vessels) and *Margavarana* (blockage of the circulatory channel)

## **DHAMANI PRATHICHAYA -THICKENING OF BLOOD VESSELS**

*Dhamani prathichaya* is one among the *Kaphaja Nanathmaja Vyadhi*<sup>8</sup>

Abnormal accumulation of *Kapha* and *Medhas* results in the *Shonithabhishyandha*, this itself will get adhered to the *Dhamani*.<sup>9</sup> this results in the reduction in the space of the lumen of *Dhamani* causing increase in tortuosity and thickening due to which distensibility of the *Dhamani* reduces, filling of the *Dhamani* then precipitate mass within the *Dhamani* called as *Siraja Granthi*, i.e Atherosclerotic plaques thus developed are vulnerable to fissure erosion or rupture resulting in *Margavarana* i.e either acute thrombosis ischemia or infarction, which itself is the root cause of many diseases, this stages of *Dhamani Prathichyaya* can be explained accordingly.

### ***Dhamani Upalepa*<sup>10</sup>**

Here *Upalepa* refers to the *Lepana Kriya* to the *Dhamani* as it is well known that *Pichila Guna* is responsible for the *Lepana Karma* which can be understood as *Pichila Guna* of *Kapha* and *Medha* causing *Lepana* to *Dhamani*.

That is due to excessive fatty food habits and sedentary lifestyle there will be increase in the LDL which result in infiltration and entrapment which is the first step in atherogenesis.

### ***Dhamaninam Pushtatha*<sup>11</sup>**

Later this *Dhamani* attains *Pushthatha* that is *Krithaposhana Bhava* and undergoes changes in their structure due to excessive deposition of fatty substances in the vessels which undergoes sort of vascular remodelling hence vessels impacted by atherogenesis often experience compensatory expansion or an increase in diameter.

### ***Visthara Bhava*<sup>12</sup>**

Here *Visthara Bhava* which refers to expansion or diffusion, because of Calcification deposits between the outer wall of atheroma and muscular wall which as they progress leads to the loss of elasticity and stiffening of artery as whole.

## **ATHEROSCLEROSIS FORMATION**

Atherosclerosis is specific form of atherosclerosis affecting primarily the intima of large and medium sized muscular arteries and is characterised by fibrofatty plaques or atheroma<sup>13</sup>. atherosclerosis is attributed to abnormalities in plasma lipoprotein and derangements in lipid metabolism. sedentary lifestyle initially leads to dyslipidaemia with high total, LDL or low HDL cholesterol. Dyslipidaemia in turn promotes atherosclerosis by amplifying or augmenting endothelial dysfunction and inflammatory pathways in vascular endothelium .atherogenesis is carried out by infiltration and entrapment of LDL in blood vessel causing atheroma further there occurs remodelling of the blood vessels with compensatory enlargement ,increased diameter and reduced elasticity and eventually narrowing lumen due to this unstable atheromatous plaques vulnerable to erosion ,rupture causing acute thrombosis.<sup>13</sup>

*SantharpanaNidana*



*Kaphamedho Vrudhi*



*Shonithabhishyanda*



sedentary lifestyle



metabolic syndrome



dyslipidemia



*RasarakthamargaUpalepa*



*Dhamaniprathichyaya*



*Margavarana*

atherogenesis



atherosclerosis



thrombosis

### Importance of *Vyana Vayu*

*Vyana Vayu* which by nature stimulate the process of circulation, always causes circulation of *Rasa Dhatu* all over the body simultaneously and continuously. When the flowing *Rasa Dhatu (Raktadi Drava Dhatu)* becomes obstructed by any defect in the passage, disease is produced in that area, just as when a cloud in the sky starts to rain in the area where it stops, disease is produced in that area.<sup>14</sup>

### DISEASES DUE TO *MARGAVARANA*

#### 1) *Vataraktha*

The pathology of *Vatarakta* is explained by obstruction to the *Rakta Marga*, particularly in the extremities, with resulting morbidity of *Vata Dosha*. Here, *Rakta* leads to *Vayu's Avrutha*, and this *Avrutha Vayu* leads to the vitiation of *Rakta* throughout the body. The *Kapha* and *Medhas* initiate the obstruction of *Rakta Marga* in the variant form of *Vatrakta*. In this case, the modified treatment's primary goals are to eliminate *Kapha* and *Medhas*. In the peripheral circulation, atherosclerosis causes intermittent claudication and gangrene and can jeopardise limb viability.<sup>15</sup>

#### 2) *Vatavyadhi*

Any *Marma* (vital organ) in the body can be injured by endogenous or exogenous stimuli; the exogenous element like trauma is what damages the *Marma*. On the other hand, doshas are natural factors that might cause affliction, which in turn can cause *Marmabhighata*. On the other hand, *Margavarana* being the major cause of *Vatavyadhi*, this may happen in the *Shiras* (head) leading to *Shiro Marmabhighata*. In the context of therapeutic indication of *Eranda Taila* (*Ricinus communis* Linn), the relation between *Vata Vyadhi* and *Margavarana* due to *Kapha*

and *Medhas* is ascertained. It is said that *Pakshaghata* is an illness caused by *Margavarana* due to morbid accumulation of *Kapha* and *Medhas*.<sup>16</sup>

Atherosclerosis of the arteries supplying the central nerve system frequently triggers strokes and temporary cerebral ischemia.

#### 3) *Muthraukasada*

Abnormal accumulation of *Pitta* and *Kapha* in the *Marga* which in turn vitiates the *Vata Dosha* and interferes with *Basthi* function. (normal renal function) This pathophysiology results in painful micturition and turbid urine that is pale yellowish or reddish in colour. Additionally, rather than focusing on *Vata*, this unique pathophysiology treatment aims to improve *Pitta* and *Kapha*.<sup>17</sup>

Renal artery stenosis may result from atherosclerosis, which is also a common site of atheroembolic illness.

#### 4) *Hritshula*

Chest discomfort arises from the morbidity of *Vata* dosha due to the restriction of *Rasa Dhatu* and *Rakta Dhatu* by the *Kapha* and *Pitta* in the *Hridaya* (heart). The context provides an explanation of the complications that result from not treating *Margavarana* in the case of *Hidroga* (cardiac pathology) in *Vatavyadhi Adhyaya*.<sup>18</sup>

atherosclerosis of the coronary arteries commonly causes angina pectoris and myocardial infarction.

#### DISCUSSION

These days, lifestyle disorders are on the rise due to sedentary lifestyles and poor dietary habits. The causes of metabolic syndrome include the consumption of a high-fat diet and lack of physical activity. Overindulgence in *Snigdha*, *Madhura*, *Guru Ahara* (excessive unctuous sweet heavy food items) *Diwaswapna*, (sleeping during day time) incompatible foods, and other *Santharpana Nidhana* (sedentary lifestyle) leads to an increase in *Kapha* and *Medhas*. These *Kapha* and *Medhas* then accumulate in the *Rasa Rakta Marga*, resulting in *Shonitabhishyanda* and *Margavarana*. *Margavarana* is the primary cause of atherosclerotic changes, leading to various diseases such as thrombosis, myocardial infarction, and cerebrovascular accidents.

Dyslipidemia, also known as *Shonitabhishyanda*, is characterized by elevated serum lipids, including LDL and total cholesterol, and decreased HDL values. Similar to the description of *DhamaniPrathichyaya*, dyslipidemia causes atherosclerosis and endothelial dysfunction. This is explained by the entrapment and infiltration of LDL in blood vessels, resulting in atheroma formation. Atheroma causes an increase in lumen diameter and a decrease in elasticity, ultimately leading to the development of atheromatous plaques that are susceptible to rupture, ischemia and infarction.

#### CONCLUSION:

In conclusion, the pathological ailment known as *Margavarana* is a pathological event brought on by *Santharpana Nidana*, *Kapha Medha Vardhaka Ahara Vihara*, and *Viruddha Ahara*. This leads to *Dhamani Prathichyaya*, which, in turn, causes the onset of various diseases. Therefore, it is a prime importance for a physician to identify and understand the pathology of *Margavarana* in a disease and treat accordingly.

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