

ISSN 2456-3110 Vol 5 · Issue 5 Sept-Oct 2020

Journal of Ayurveda and Integrated Medical Sciences

www.jaims.in

Indexed

An International Journal for Researches in Ayurveda and Allied Sciences





Journal of Ayurveda and Integrated Medical Sciences

> **REVIEW ARTICLE** Sept-Oct 2020

Conceptual study of *Dhamani* - A critical review

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ABSTRACT

Ayurveda is been practiced in India for at least 5000 years, but in present time it is becoming more popular in whole world due to its holistic approach. Acharyas has used an anatomical term Dhamani which is on controversial term. Ayurvedic text which are Ancient works in the field of Rachana presented by Acharya Sushruta, Charaka, Vaghbhata and other. Dhamani is a structure introduced by ducts with thin wall and carry Rasa all over the body i.e. Sharira. The term Dhamani generally used in same sense as Siras and Srotas. Interpretation of these Ayurvedic terminologies is confusing in many contexts. Acharya Sushruta clearly explained the constitution of the human body and difference between Sira (vein), Dhamani (artery), Srotas (capillaries). Dhamani is a specific anatomical structure by critically reviewing all possible literature both as per Ayurveda and modern science.

Key words: Ayurveda, Dhamani, Sira, Srotas, Artery, Nerve, Vein.

INTRODUCTION

Ayurveda is treasure of knowledge which was developed and discovered by our great ancestors. To understand and properly execute this knowledge we must have the knowledge of Sharira, Ayurveda the Kriyasamarthya (action potential) is assigned to the Doshas and these Doshas are being carried by the structural entities called Sira and Dhamani. Though structural scientific knowledge of the life was recommended by ancient Acharya. The knowledge of Rachana Sharira (anatomy) is mandatory for students of any system of medicine. The term Srotas, Siras and Dhamani are old as Vedas. They have been used as same but these all are different. In general Sira and

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Quick Response Code Website: www.jaims.in Published by Maharshi Charaka Ayurveda Organization, Vijayapur, Karnataka (Regd) under the license CC-

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Dhamani means blood vessels. Dhamani is another name for Prishniparni (a medicinal plant), identified with the Uraria picta from fabaceae or legume family of flowering plant, together with names *Dhamani* and Prishniparni, there are a total of twenty four sanskrit synonyms identified to this plant. Acharya Sushruta has said to be the father of the surgery because of description available in Sushrut Samhita regarding methodology for learning of the anatomy, dissection on cadaver, Dhamani, Sira, Srotas, Marma etc. he has given more emphasis on the practical knowledge. In Sushrut Samhita Dhamani word is used in many references like Moola of Srotas, Nabhinadi, etc. the up-coursing Dhamani perform such specific function of body on sound, touch, taste, smell, sneezing, laughter, speech, etc. and tend to maintain the integrity of the body. The down- coming Dhamanis form the channel for downward conveyance of Vayu, urine, stool, semen, containated food. Dhamanis carry Rasa all over body and fill it with air, it is significant that the conveyance of Rasa is confirmed to the Dhamanis only. On the other hand Dhamanyath Anilapuranath Dhamani technically speaks about related structure of arteries but when added the word Nadi which are also arteries we have to limit the meaning of palpable arteries. Though we have Hrudaya and Nabhi as Mulasthana of Rasavaha Srotas

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but neither case in any way justifies the Dasha Dhamani.

Classification of Dhamani by Acharya

1. Sushruta total	24
Urdhva	10
Adho	10
Tiryak	10
2. Charaka	10
3. Bhavprakasha	24
4. Asthanga Hridaya	24
5. Kashyapa	200

CONCEPT OF DHAMANI

The Atharvaveda refers to Dhamanis which are duct with thin wall equivalent to arteries, Siras- which are duct with thin wall equivalent to vein and still finer ducts are referred to as Snayu similar to capillaries. Acharya Charaka starts from the root meaning of Dhamani. Dhamani is pipe like structure or tubular vessels or canal of the human body which starts from heart or from umbilicus on supported to carry Rasa.

According to *Charaka, Dhmanat Dhamanyaha.* Hence *Dhamani* is that tract which produces sound (by Agnivesha). According to *Sushruta - Siras* and *Dhamani* are channels other than *Srotas* and *Nabhi* is the site of origin of both *Dhamani* and *Sira*. Even in *Ashtanga Sangraha, Ashtanga Hridaya, Charaka, Nabhi* word has been used in reference to fetal life. Sushruta mentioned his view in relation to the origin of *Dhamanis* from *Nabhi* to *Hridaya* in *Sutrasthana Shonitavarniya Adhyaya* and *Charaka* has also mentioned in 30th chapter of *Sutrasthana* that *Dhamanis* arrives from the *Hridaya*.

MATERIALS AND METHODS

The literature on *Dhamani* collected from all available classical as well as modern text, the present study

depends on the data collected from Ayurvedic Samhitas and modern books, national and international journals. previous work done, paper presented, magazines, etc. data studied, reviewed and the appropriate conclusion have been withdrawn from reviewed literature . Tried to identify and understand the term used in ancient literature. This article will be help to know about *Dhamanis* from ancient science.

OBSERVATIONS AND DISCUSSION

Dhamani in Ayurvedic literature

The description of *Dhamani* is stated by *Dhamani "Dhamanyat Anilapuranath Dhamani"* is specifies *Nirukti* of *Dhamani* i.e. that which is pulsating and by this means it is filling the *Vata* into it.

According to Sushruta Dhamani arising from Nabhi, ten separated upward, ten downward, and four sideward (transverse). Charak said that 10 Dhamani arises from Hridaya. In Asthanga Sangraha it is said that *Dhamanis* are 24; by them the entire body get supplied with nourishment similar to vast plot of land by cannals, carrying water from them (Dhamani) the Nabhi is surrounded just as axle hole by the (spokes of wheel) at the umbilicus (centre) life is designed to well, hence it is seat of internal fire. Bhavaprakash also said that Dhamanis are originated from Nabhi and are 24 in number from among them, ten spread upward, ten downward and four in different directions. These vessels have got minute outlet, through which Rasa move in entirely similar to the flower stalk to lotus where pores are present naturally. Dhamanis have а tendency of tridimentional and reaches out all parts of the body by continuous ramification, as that of the channels of river source and reaches out the opening of sweat glands which are present at hair follicles and performs the letting out of the sweat from the body; this set of reticulation is also used to circulate the Rasa internally and externally foe nourishment; this is the set up even for the absorption of medicaments applied on the skin like Abhyanga, Parisheka, Avagaha, Alepa, etc. by doing the Santarpana as a means of Rasa circulation. Dhamanis are totally

responsible for *Dharana* of entire *Deha*. The statements *Dhamanis* are *Rasavahini* and they are pulsating because of *Vata* confines the function of circulatory system. According to *Acharya Kashyap Dhamanis* are 200 in number and arises from *Karnamula*. Each *Karnamula* having 100 dhamani origin and fill it with air.

Reasons of confusion in Sira Dhamani Srotas.

Identifying all these as one and same are due to

- 1. Sannikarsha (nearness)
- 2. Sadrishyagamatva (similarity in description in text)
- 3. Karmukatva (similarities of function)
- 4. Saukshmatva (minuteness)

These four reasons are not very scientific, the statements of modern science that vein, arteries, channels are identical is because all these are hollow tubes, similarity of function i.e. Vein and arteries are passage of circulation of *Rasa Rakta*. by all these reasons these structure may not be distinguished easily. Similarity between the functions of dhamani i.e. (arteries) and nerves is because these function are independent and supplementary to one another.

Reasons of differences in Sira Dhamani Srotas

- Difference in features Sira (vein) are carrying Vata, Pitta, Rakta and described as light red, blue, white and deep red in colour respectively, whereas Dhamani are described as having no colour and Srotas as having as same colour of Dhatu in which they are present.
- Number at origin Siras are forty in numbers, Dhamanis are twenty four and Srotas are twenty two
- Special functions Mind and intellect without any hindrance (interruption) is the function of the *Sira*. Whereas the function of *Dhamani* are perception of object of senses (touch, smell, taste etc.)
- 4. Description in texts treatises of Ayurveda have mentioned *Sira*, *Dhamani* and *Srotas* separately at

many places. Hence *Dhamani* and *Srotas* are different from *Sira*.

Sushruta has given greater emphasis to *Dhamani* (arteries) and attributed all functions to these purvey the three *Doshas* also along with *Rasa Dhatu*.

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Dhamani Marma

Dhamani Marma is introduced by Acharya Vaghbhata. In the current era we observe that Marmaabhighat leads to death, delayed death, or any deformities. According to Vaghbhata there are six types of Marma, he has enumarated a sixth group of Marma known as Dhamani Marma. Dhamani Marma is one such vital region in human anatomy which falls under the classification on the basis of structured involved.

Urdhvaga Dhamani (*Dhamani* of head and neck region)

Those spreading upward, support (maintain) the body by attending to functions such as receiving sensation of Sabda (sound), Sparsha (touch), Rupa (sight), Rasa (taste) and Gandha (smell); Praswas (inspiration), Ucchwas (expiration), Jrimbha (yawning), Kshavathu (sneezing), Hasita (laughing), Kathita (talking), Ghosita (shouting) and such other functions. These after reaching the Hridaya (heart) each one divides into three, thus becoming thirty. Out of these, two each carry Vata, Pitta, Kapha, Sonita and Rasa - thus ten. Two each carry sensation of Sabda (sound), Rupa (sight), Rasa (taste) and Gandha (smell); - thus eight. two attends to Kathita (speaking in words), two attends to Ghosita (shouting or loud sound without words), two attends to Swapiti (sleep), and two to Pratibudhi (waking), two carry Ashru (tears in the eyes), two carry Stanya (breast milk) in the breasts of women, these only carry Sukra (semen) from the breast in men-thus twelve. Thus, total thirty Urdhvaga Dhamanis are described by their divisions. By these (Dhamani), parts of the body above the umbilicus, such as the abdomen, flanks, back, chest, shoulders, neck, arms etc. are supported and maintained. The upward Dhamani perform all these functions always (throughout life). Dr. Ghanekar and Gangadher Shastri both have submitted his statements in reference to

the above couplet. Pandit Gangadher Shastri has labelled all these Dhamani as nerve in the following Sabdavaha Dhamani (auditory nerves), order. Rupavaha Dhamani (optic nerves), Rashavaha Dhamani (nerves of taste i.e. branch from glassopharyngeal and lingual nerves), Gandhvaha Dhamani (olfactory nerves), Bhasan Dhamani (inferior laryngeal nerves, Ghosakar Dhamani (hypoglossal nerves) and Ashruvaha Dhamani (lacrimal nerves). Dr. Ghanekar preferred to label some of these vessels as internal auditory artery for Sabdavaha Dhamani (voice carrying vessels), central retinal artery for sense of Rupavaha Dhamani (vision), lingual artery for Rashavaha Dhamani (sense of taste), sphenopalatine branch of internal maxillary artery for Gandhvaha Dhamani (the sense of smell), laryngeal artery for Ghosakar Dhamani (the sense of sound), sublingual artery for Bhasan Dhamani (the sense of speech), lacrimal artery for Ashruvaha Dhamani (the sense of lacrimation), mammary artery for Stanyavaha Dhamani (the sense of lactation). The modern correlation of Urdhwaga Dhamani is given below

- a) Sabdavaha Dhamani Internal auditory artery (acoustic nerve)
- b) *Rupavaha Dhamani* Central retinal artery (optic nerve)
- c) Rasavaha Dhamani Lingual artery (nerves of taste that is branches from glossopharyngeal and lingual)
- d) *Gandhavaha Dhamani* Sphinopalatine branch of the internal maxillary artery (olfactory nerve)
- e) Ghosakar Dhamani Laryngeal arteries (inferior laryngeal nerve)
- f) Bhasan Dhamani Sublingual artery (hypoglossal nerve)
- g) Ashruvahi Dhamani Lacrimal artery (lacrimal nerve)
- h) Stanyavahi Dhamani Mammary artery

Since the *Dhamani* (arteries) present in the (region of) the heart (the breasts) open after three or four days (after the birth of the child), breast milk gets

produced afterwards. Some Urdhwaga Dhamanis are related to respiratory movement in which diaphragm and other muscles are involved. So, the blood vessels which supply these muscles are included in these i.e. phrenic and intercostal arteries (phrenic nerve). Except of these local arteries all other functions are controlled by brain. The principal arteries of supply to the head and neck are the two common carotids; they ascend in the neck and each divide into two branches, viz., (1) the external carotid, supplying the exterior of the head, the face, and the greater part of the neck; (2) the internal carotid, supplying to a great extent the parts within the cranial and orbital cavities. So Urdhvaga Dhamanis are correlated with all arteries and its branches which supply to head, neck, brain, upper limbs and thorax.

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Adhoga Dhamani (Dhamani of abdomen and pelvic region)

Dhamani (arteries) spreading downward purvey flatus, faeces, semen, and menstrual blood etc. downward. These, on reaching the Pittasaya acting upon the essence of foods and drinks (known as Rasa Dhatu) produce by the heat separates it into Sara (essence) and *Kitta* (waste). Purveys it throughout the body and nourish the body supplying nutrient materials present in the essence of food, supply it to the Dhamani spreading in upward and transverse direction, fill the seat of Rasa (Hridaya) and separate urine, faeces and sweat (from the Rasa). In between the Amasaya (stomach) and Pakvasaya (colon) each one of these (Dhamanis) divides into three branches thus becoming thirty; out of these, two each carry Vata, Pitta, Kapha, Sonita and Rasa thus ten. Two present in the intestine purvey Anna, two carry Toya (water produce during digestion), two present in the bladder carry urine, two are meant for production of Sukra in the testes, and two meant for its elimination, these only purvey the blood known as Artava in women and eliminate it; two attached to the large intestine are for expelling the faces - thus twelve. Another eight Dhamani supply sweat to those (Dhamani) spreading transversely; thus, the thirty branches are described. By these (*Dhamani*), the parts of the body below the umbilicus such as Pakwasaya

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(large intestines), Kati (pelvis), Mutrasaya (urinary bladder), Purisasaya (organs of faeces i.e. rectum), Guda (anus), Vasti (bladder), Medhra (penis) and Sakthi (legs) are supported and maintained. Dhamani spreading downward perform these functions all the time (throughout life). Adhogami Dhamanis are related to the abdominal region and lower limbs. Vata, Mutra, Purish, Sukra and Artava are formed (produced) in abdomen and they move downwards. These substances are formed in their respective organs after getting blood supply from their arteries and then after it move downward direction to pass from body. Adhoaami Dhamani moving out downward to reach in Amasaya and Pittasaya. This is the place of Pittadhara Kala. In this place food are digested and absorbed to form Annarasa, which nourishes the body in proper way. These functions (digestion and absorption) of intestine are possible only, when Adhogami Dhamanis supply blood to intestine. So, this Dhamani is called as Vivechak (differentiator) and Abhivahak (supplier). By the help of Adhogami Dhamanis, ingested food are digested to form Rasa, which moves upward to reach heart through Siras (veins) and Rasayanis (lymphatic vessels) to nourish the Urdhvaga and Tiryaga Dhamanis. It means that nourishment of Urdhvaga Dhamanis is indirectly done by the Adhogami Dhamanis. After digestion of food material Satmya part of digested food is absorbed by Rasa prapa (cisterna chili) and Rasa kulya (thoracic duct) to carry it in heart. Mutra (urine), Purisa (fecal matter) and Sweda (sweat) are Malas of Pakwa Anna (digested food). These Malas are differentiated in Udarvibhaga (abdominal region). Swedasravan (sweating) is the function of Tiryaggami Dhamani, but blood supply to Tiryaqqami Dhamani is the job of Adhogami Dhamani. Each Adhogami Dhamanis divided into three branches between the space of Amashaya and Pakwashaya. The arteries which supplies to Amashaya and Kshudrantra are capable to move digested food in downward direction i.e. celiac artery and superior mesenteric artery (Vagi and sympathetic nerves) are capable to do it.

Tiryaggami Dhamanis (*Dhamani* of cutaneous region)

Each one of the four Dhamani spreading sideward divide into hundreds and thousands of branches further and so becomes innumerable. By these, the entire body appears to be Gavaksita (full of windows); these knit together broadly, their mouths (openings) are attached to the Romakupa (hair follicles); these purvey Sweda (sweat to the exterior) and Rasa (chyme/nutrient tissue) both inside and outside. Through these only the potency (effect) of materials (medicines) used in the form of Abhyanga (anointing), Parisheka (pouring liquids on the body) and Lepa (application of pastes), get cooked (processed by heat) in the skin, enter into the interior of the body. The sensation of touch both comfortable and uncomfortable. Firstly, it should be decided which arteries are the lateral coursing Dhamanis. Lateral coursing can be known as cutaneous arteries which supply the skin, or which go to the sides of body. Upper coursing means those which supply to the head, neck, upper limbs, and thorax. Lower coursing means those which supply to the abdomen and lower limbs. Sushruta could not specifically tell which these four arteries which are directed laterally are. But there is a direct indication of four Dhamanis which divides to become thousands, arteries of upper limb and lower limb are not described here. So, we can accept cutaneous vessels of four limbs as four Tiryaqqami Dhamanis.^[18] Urdhvaqami Dhamanis are related to head, neck, brain, thorax and upper limbs. Adhogami Dhamanis are related to abdominal organs and lower limbs. *Tiryaggami Dhamanis* are related to outer surface of the body i.e. skin. In modern science Tiryaqqami Dhamanis are called as cutaneous or peripheral vessels.

CONCLUSION

Although opinion differs regarding the identification and function of *Dhamani*, some equate it to nerves while other to arteries, considering there number and function in the text. *Dhamani* based on their characteristics feature is a structural media to carry nutritional components. The *Dhamani* have throbbing

that indicates the presence of life, it also indicates health. The *Dhamanis* are *Panchabhutika* which help to establish contact between the sense organ and their respective object throughout the life. Authors correlate *Dhamani* to arteries accepting the definition that *Dhamanis* are called because they pulsate. On the basis of literature review and discussion, it is concluded that *Dhamani* is to be understood as artery.

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How to cite this article: Kishori Sanjeevan Agawane, Kranti Metkar. Conceptual study of Dhamani - A critical review. J Ayurveda Integr Med Sci 2020;5:308-314.

Source of Support: Nil, Conflict of Interest: None declared.

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