



**International Journal of Biology, Pharmacy
and Allied Sciences (IJBPA)**

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

A REVIEW ON PATHOPHYSIOLOGICAL UNDERSTANDING OF MAJJAVAHA SROTA DUSHTI AND ITS CORRELATION TO THE AVASCULAR NECROSIS

DWIVEDI A¹, PAUL SD² AND JAIN AK^{3*}

1: Assistant Professor, Rog Nidan Vikriti Vigyan Department, Rani Dullaiya Smriti Ayurved
P.G. College & Hospital, Bhopal, India

2: Professor, Rog Nidan Vikriti Vigyan Department, Rani Dullaiya Smriti Ayurved P.G.
College & Hospital, Bhopal, India

3: Professor, Rog Nidan Vikriti Vigyan Department, Rani Dullaiya Smriti Ayurved P.G.
College & Hospital, Bhopal, India

***Corresponding Author: Dr. Ashutosh Kumar Jain: E Mail: Drjain.ashutosh@gmail.com**

Received 25th Dec. 2025; Revised 26th Jan. 2026; Accepted 15th May 2026; Available online 1st Oct. 2026

<https://doi.org/10.31032/IJBPA/2026/15.10.10528>

ABSTRACT

Majjavaha Srotas falls under the category of *Abhyantara Srotas* and *Mula Sthana* (root or primary site) of *Majjavaha Srotas* is suggested to be *Asthi* (bone) and *Sandhi* (joints). In the context of *Ashtanga Samgrahakara*, *Parva* and *Asthi* are classified as the *Mula Sthana* of *Majjavaha Srotas*. The pathological changes associated with *Majjavaha Srotas Dushti* can be correlated to the avascular necrosis (AVN), which also possesses symptomatic similarity to *Asthimajjagata Vata*. Bone marrow degeneration is an early and significant aspect of the pathologic process associated with AVN and its development and progression. Bone marrow degeneration is attributed to disruption of blood supply to the affected bone which also triggers pathogenesis of Avascular Necrosis (AVN). Pathophysiologically, AVN occurs due to insufficient blood flow resulting from the occlusion of the bone's vascular supply, due to trauma, embolism, thrombosis

or idiopathic causes; contributing to *Srotorodha* resulting in ischemic necrosis. The symptoms may include bone pain, restrictions in joints, weakness, insomnia and numbness, etc. Vitiating can occur from poor diet, ageing, lifestyle factors, trauma, stress and chronic disease, etc. This review study observed that the bone marrow degeneration caused by disrupted blood supply is the key pathological event linking *Majjavaha Srotas Dushti* with Avascular Necrosis.

Keywords: *Majjavaha Srota, Avascular Necrosis, Asthimajjagata Vata, Srotorodha*

INTRODUCTION

Majjavaha Srotas are the channels that are responsible for the production, transport and nourishment of *Majja Dhatu* (bone marrow). According to Ayurveda, the process of *Dhatu* formation is sequential in nature. According to Ayurveda, when *Dhatu* formation process takes place then *Majja Dhatu* is formed after the formation of *Asthi Dhatu*. The cavities in the bones, filled with this marrow [1-3]. Because bones turn into marrow therefore *Asthi* is considered *Moola* of the *Majjavaha Srotas*. The *Sandhi* is also classified as *Upadhatu* of *Meda Dhatu*, therefore it is also considered as one of the roots of *Majjavaha Srotas*. Functionally *Majjavaha Srotas* provides nourishment and fills in the cavities of bone with marrow. *Majja Dhatu* is considered as a vital component in sustaining and nourishing the nervous system since *Snigdha* and *Sara Gunas* of *Majja* help to maintain myelin sheath thus strengthen nervous system. Proper nourishment of *Majja* is dependent on properly balanced *Agni* and proper sequencing of *Dhatu poshana*, while

vitiating of *Majjavaha Srotas* give rise to diseases of the bone marrow [3-5].

From a contemporary view, *Majjavaha Srotas* can be correlated with the channels that transport bone marrow and provide nourishment to nervous system. Impairment in this process may lead to degenerative or neurological disorders.

METHODS ADOPTED FOR THIS REVIEW:

Literature search was performed to lay out clinical case reports and clinical studies relevant to *Majjavaha Srotodushti/Asthimajjagata Vata* and Avascular Necrosis. Electronic databases were searched from various sources such as; Scopus, Web of Science, Google Scholar, AYUSH Research Portal, and subsequent Ayurvedic journals, etc. Search terms that included the concepts of Ayurveda and the terms of modern medicine were combined with use of Boolean operators. The major terms searched for study were included *Majjavaha srotas, Asthimajjagata, avascular*

necrosis, AVN and *Majjavaha Srotodushti*, etc. Study included case reports, clinical trials, observational studies and review studies of subject specific area.

Majjavaha Srotas Strotodushti

Dushti in *Majjavaha Srotas* may contribute to the pathological problems like osteoporosis, demyelination and degenerative bone disorders, etc. The primary causes of *Majjavaha Srotodushti* include *Utpeshan* (crush injuries), *Abhigata* (trauma that can produce tissue detriments), *Prapidana* (compression injuries), *Viruddha sevana* (consuming incompatible foods) and *Ati Abhishyandana* (excessive *Kapha* disturbance) [4-6]. These factors triggers vitiation of *Majjavaha Srotas*, the *Majja Dhatu* is not nourished properly and marrow loses its unctuous and strengthening properties. This causes weakness, degeneration of the nervous tissue and neurological disturbances [6-7].

Following symptoms may observe after the disruption of *Majjavaha Srotas*:

- ✚ *Bhrama* (giddiness or vertigo)
- ✚ *Murcha* (fainting or loss of knowledge)
- ✚ *Tamo Darshana* (perception of darkness)
- ✚ *Aroomshi* (scalp disorders)

✚ *Sthoola Moola* of *Parvas* (swelling or enlargement of inter-phalangeal joints)

Pain and enlargement of the joints, are primarily symptoms which occurs due to the vitiation of *Majja Dhatu*. Symptoms such as giddiness, loss of consciousness and the sensation of darkness are also related to the vitiation of red marrow contained in the diploe of cranial bones. Therefore, when *Majja* is vitiated, it may cause impairment of bone marrow tissue which further depletes nourishment of nervous tissue [7-9].

The features of *Majjavaha Srotodushti* can also be understood in terms of *Dosha* disturbance. *Vata Vriddhi* includes symptoms of tremors, tingling, stiffness of the body, numbness, sleeplessness and hypersensitivity. These occur as a result of *Vata* aggravation leading to degeneration and loss of coordination. The *Pitta Dushti* symptoms include hypersensitivity in the area supplied by a particular nerve branch, irritability, inflammation, disturbance of mental capacity and anger. The *Kapha Dushti* symptoms include heaviness of the head, slow nerve conduction, dullness of the senses and lethargy, etc. Elevated *Pitta* generates excess heat in the *Srotas* of *Majjavaha* causing degeneration of *Majja Dhatu*, while elevation of *Kapha* may lead to obstruction and

stagnation in these channels. Hence, vitiation of *Dosha* balances with *Majja Dhatu* function, producing symptoms as mentioned above [8-10].

***Majjavaha Srotas Dushti* and AVN**

Majjavaha Srotas Dushti is an important aspect of the pathophysiology of avascular necrosis (AVN). In Ayurveda, it can be correlated to the *Asthimajjagata Vata*, which means the progressive degeneration of the bone and marrow due to circulation impairment. The *Majjavaha Srotas* is channels which serve the vital role of transporting and nourishing *Majja Dhatu* (marrow tissue) and this *Majja Dhatu* further nourishes nervous tissue [10-12]. In modern anatomical terms, these channels can be understood as the bone marrow and nerve fibers, whose proper condition plays a vital role in the maintenance, repair and overall functioning of body tissue. There are numerous causes for the vitiation of *Majjavaha Srotas*. Unhealthy lifestyle habits, such as irregular habits, insufficient sleep, and the suppression of natural urges create depletion of *Dhatu* as the outcome of *Dosha* vitiation leading to *Agnidushti* and dysfunction of the channels. Chronic disease can also result in *Majja Kshaya*. Physical

injury and emotional stress can both add a substantial burden to the health of the nervous system and marrow vitality [11-13].

Pathologically AVN is a condition that represents the end result of bone tissue dying due to the lack of blood supply from the femoral head and its attachments. This can be correlated with Ayurvedic condition which suggesting that the *Vata dosha*, in its disturbed state, is the result of the disruption in function of *Asthivaha Srotas* and *Majjavaha Srotas*, initiating a state of tissue degeneration. When *Vata* is further aggravated by *Dhatu* depletion and *Srotas* is obstructed, dry tissue degenerates and nourishes bone and marrow tissues insufficiently. *Srotorodha*, a type of channel obstruction from tissue debris and *Dosha* accumulation, lead to ischemic damage similar to vascular occlusive disease, ultimately resulting in necrosis. Clinically, these manifestations parallel AVN and include persistent bone pain, tissue wasting, joint dysfunction, numbness, and weakness [14-16]. Table 1 depicted some reports that directly associate Ayurvedic concepts of *Majjavaha Srotodushti* / *Asthimajjagata Vata* with clinical outcomes of Avascular Necrosis (AVN).

Table 1: Published data correlating *Majjavaha Srotodushti* / *Asthimajjagata Vata* with AVN

S. No.	Citation (year)	Design (n)	Outcome of diagnosis
1	Thakur C, Srivastava S., 2024	Case study (n=1)	<i>Asthimajjagata Vata</i> ↔ AVN femoral head [16]
2	Chaturvedi A et al., 2016.	Case report (n=1)	<i>Asthimajjagata Vata</i> ↔ AVN bilateral femoral heads [17]
3	Singh SK et al., 2023.	Case report (n=1)	<i>Asthimajjagata Vata</i> / AVN (bilateral hips) [18]

Dosha Involvement in *Majjavaha Srotas Dushti*

In *Majjavaha Srotas Dushti*, each of the three *Doshas* results in particular signs and symptoms of AVN. *Vata* disturbance, for example, typically shows up as tremors, numbness and stiffness, caused by its disruptive effects on the nervous system and blood circulation throughout the bone-marrow channels. *Pitta* disturbance is associated with irritability, anger and altered mental activity which relates to *Pitta's* effect on cognitive and emotional regulation. *Kapha* disturbance leads to lethargy and swelling, which indicates

excess fluid in the bone-marrow channels [17-19].

The connection between *Majjavaha Srotas* and avascular necrosis (AVN) occurs through their combined effects due to *Dhatu kshaya* and *Srotorhodha*, which disrupt the integrity of bone and marrow. *Doshas* can cause *Margavarodha*, thus reducing blood flow and nutrient supply to joint tissues in ways similar to AVN, resulting in necrosis and similar types of joint dysfunction. Specific causative factors contributed towards *Majjavaha Srotas Dushti* which further results symptoms of AVN as mentioned in **Table 2**.

Table 2: Impact of etiological factors on *Majjavaha Srotas* and related symptoms of AVN

Factor	Impact on <i>Majjavaha Srotas</i>	Relation to AVN
Improper Dietary Habits	Leads to obstruction, poor nourishment of <i>Majja Dhatu</i> , and <i>Srotodushti</i> .	Poor nourishment of bone marrow impairs blood supply to bones, increasing risk of AVN ²⁰
Improper Lifestyle (<i>Vihara</i>)	Disturbs formation and maintenance of <i>Majja Dhatu</i>	Chronic depletion of <i>Majja</i> can weaken bones and joints, predisposing to AVN
Chronic Diseases & <i>Dhatu Kshaya</i>	Improper formation of <i>Majja Dhatu</i> , weakening of channels	Bone marrow insufficiency reduces vascular supply, a known factor in AVN development
Ageing & Degeneration	Degeneration of <i>Majjavaha Srotas</i> , increased vulnerability to <i>Majja disorders</i>	Age-related bone and marrow degeneration increases susceptibility to AVN
Mental Stress & Trauma	Direct impact on <i>Majja Srotas</i> (brain & nervous system), leading to <i>Majja Dushti</i>	Stress-induced hormonal and vascular changes may impair bone perfusion, contributing to AVN
Injury or physical trauma particularly to the epiphyseal or subchondral regions	Direct disruption of <i>Majja Dhatu</i> and circulation in <i>Majjavaha Srotas</i>	Trauma can directly compromise blood flow to bone, triggering AVN

Unhealthy eating habits can cause obstruction and inadequate nourishment of the *Majja Dhatu*, leading to *Srotodushti*. Thus insufficient blood supply affects nourishment of *Majja Dhatu*, which may further increase risk for avascular necrosis (AVN). Factors such as *Ativyayama*, *Atishoka*, *Nidra Viparyaya*, *Atiruksha Ahara* and *Ati-Upavasa* may also disturbs *Majja Dhatu* formation, leading to chronic depletion of *Majja* which weakens bone and joints making them more prone to AVN. Chronic illnesses and *Dhatu Kshaya* can interfere with adequate *Majja* generation, weakening the channels, causing not enough *Majja* to transfer to the bone marrow and leading to reduced vascular supply which can contribute to developing AVN. Age and aging issues contribute to the breakdown of *Majjavaha Srotas*, leading to

disordered function of *Majja* and aging-related degeneration of the bones and marrow making AVN more likely to occur. Mental stressors and trauma will directly affect the *Majja Srotas*, especially those of the brain and nervous system, leading to *Majja Dushti*. Stress will lead to hormonal and vascular changes, again limiting perfusion to the bone which contributes to AVN. Finally, injury and/or trauma will disrupt the *Majja Dhatu* and blood supply through the *Majjavaha Srotas*, disrupting blood flow to the bone and possibly resulting in AVN [19-21].

Ayurvedic Management of AVN associated with *Majjavaha Srotas Dushti* [22-25]

The various Ayurvedic principles of symptoms and disease management in case of AVN are depicted in **Figure 1**.

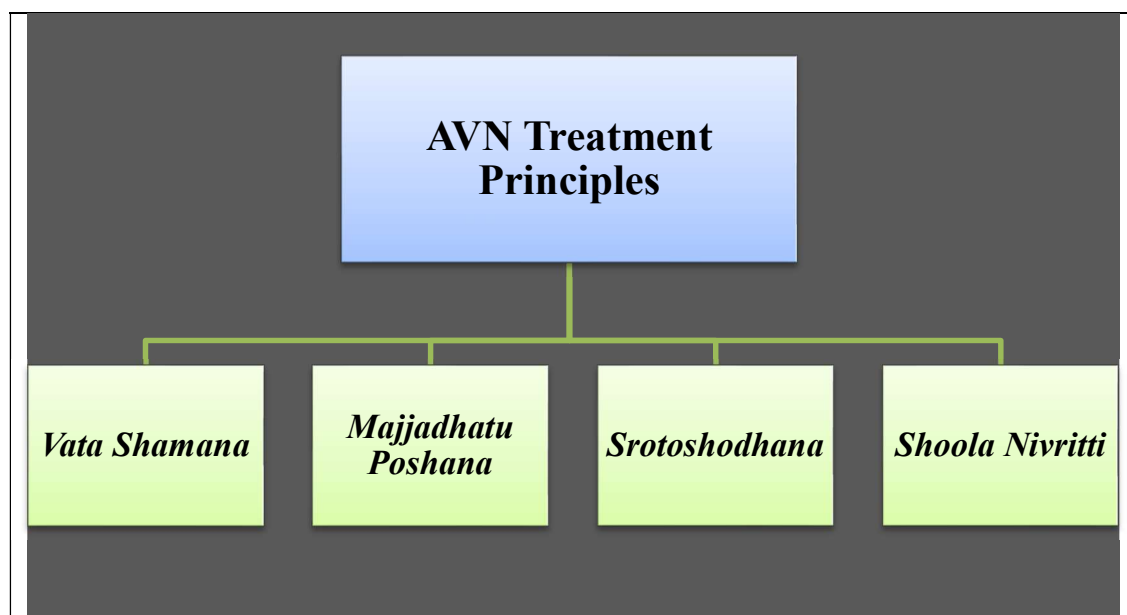


Figure 1: AVN Treatment Principles According to Ayurveda

Vata Shamana is essential, as *Vata* is primarily responsible for degeneration, and therapies and medications that calm *Vata* will relieve pain, stiffness, and prevent further deterioration. *Majjadhatu Poshana* is brought into practice with the use of *Rasayana* herbs and nutrient therapies like *Ashwagandha*, *Shatavari*, *Guduchi* and *Bala* [26-28]. *Srotoshodhana* (cleaning the channels) procedures such as *Abhyanga*, *Swedana* and *Basti* contribute to the clearing of blockages in the *Majjavaha Srotas*. This approach also increasing circulation to the bone marrow and nourishing the bone marrow with nutrients. The *Shoola Nivritti* (pain management) component is addressed with warm medicated oils and *Vata* reducing therapies using analgesic medicines and massage with herbal oil. *Ahara-Vihara* also play key role; *Vata* reducing diet, gentle exercise, *Yoga* and adequate sleep helps in circulation and joint mobility. *Sneha* therapy with medicated oils used to nourish the bone marrow and joints. *Panchakarma* therapies, particularly *Basti* stimulate the marrow; play a vital role in treating AVN. Herbal formulations like *Guggulutiktaka Ghrita* and *Rasnadi Kwatha* are also used to reverse depletion of the *Dhatu* and influence regeneration of bone marrow. *Manjisthadi Majja Basti* and *Kshara Basti* can provide symptomatic relief, improve joint

mobility, and reduce pain of AVN. Obeying rules of *Swasthavritta*, *Sadvritta*, *Dinacharya* and *Ritucharya* also helps to restore strength of *Dhatu* and prevent early denegation of *Asthi* and *Majja*.

CONCLUSIVE REMARK

This review suggests a possible pathophysiological connection between *Majjavaha Srotodushti* and avascular necrosis (AVN) of bone: both conditions describe the progressive loss of marrow viability resulting from impaired microcirculation, ultimately resulting in pain, joint dysfunction and structural collapse.

LIMITATIONS OF THEIS REVIEW

The literature base is almost entirely case reports & case series without control groups, so causal inference is difficult to drawn. Limited external validity, inadequate reporting of adverse events and no formal assessment of quality or risk of bias were reported for included reports.

CONCLUSION

This review study noted that degeneration of bone marrow resulting from impaired blood supply is the principal pathological event connecting *Majjavaha Srotas Dushti* with avascular necrosis. The observed symptoms of *Majjavaha Srotas Dushti* vary depending on affected part; if *Majja* get affected, then *Parvashula*,

Asthishula and *Sandhishula* arise as symptoms of *Majjavaha Srotas Dushti*. The pathology of *Majjavaha Srotas Dushti* resembles to AVN when speaking about the absence or loss of nourishment of bone marrow within *Srotas* or degeneration of *Majja* due to *Vata Dosha* effect, non-healing phase parallels ischemic necrosis in anthropomorphism. The Ayurvedic treatment of AVN encompasses *Vata Shamana*, *Majjadhatu Poshana* approaches through the use of *Rasayana* herbs. *Srotoshodhana* achieve through the means of *Abhyanga*, *Swedana* and *Basti* therapies. Herbal formulations are also utilizes to promote regeneration of the bone and improving nourishment of affected tissue. Furthermore, following the principles of *Swasthavritta*, *Dinacharya* and *Ritucharya* helps to maintain the integrity of the *Dhatu* and prevent degeneration, thus restrict pathogenesis of disease.

Author Contributions

Each author has equally contributed in planning the study, performing the analysis, writing and editing the manuscript. All authors have read and agreed to the published version of the manuscript.

Acknowledgement

All the authors are thankful to the organization and the management team for the support.

Conflict of Interest

There is no conflict of interest.

Funding sources

Nil

REFERENCES

- [1] Acharya YT. *Charaka Samhita* of Agnivesa. Reprint ed. Varanasi: Chaukhamba Orientalia; 2009: 250.
- [2] Acharya YT. *Charaka Samhita* of Agnivesa. Reprint ed. Varanasi: Chaukhamba Orientalia; 2009: 179.
- [3] Vagbhata. *Astanga Sangraha* with *Sarvangasundara Vyakhya* by Arunadatta and *Ayurveda Rasayana Teeka* by Hemadri. Varanasi: Chaukhamba Subharati Prakashan; 2017.
- [4] Acharya YT. *Charaka Samhita* of Agnivesa. Reprint ed. Varanasi: Chaukhamba Orientalia; 2009: 251.
- [5] Kunte AM, editor. *Sarvangasundari Commentary*, Chikitsasthana 21/57–60. In: Vagbhata, *Astanga Hridaya* with Arundatta. Reprint ed. Varanasi: Chaukhamba Orientalia; 2011: 726.
- [6] Acharya YT, Acharya NR. *Susrutha Samhita* of Susrutha. Reprint ed. Varanasi: Chaukhamba Orientalia; 2013: 113.
- [7] Acharya YT, Acharya NR. *Susrutha Samhita* of Susrutha. Reprint ed.

- Varanasi: Chaukhamba Orientalia; 2013: 391.
- [8] Tripathi B. *Sharangadhara Samhita*, Madhyama Khanda 2/137–142. Reprint ed. Varanasi: Chaukhamba Orientalia; 2023: 102.
- [9] Agnivesha. *Charaka Samhita, Ayurveda Dipika* Commentary of Chakrapanidatta and *Nirantarapada Vyakhya* by Jejjata. Vol 2. Varanasi: Chaukhamba Subharati Prakashan; 2017.
- [10] Acharya YT. *Charaka Samhita* of Agnivesa. Reprint ed. Varanasi: Chaukhamba Orientalia; 2009:445.
- [11] Agnivesha. *Charaka Samhita*, Chakrapanidatta Commentary, ed. Vaidya Jadavaji Trikamji Acharya. Varanasi: Chaukhamba Sanskrit Sansthan; 2022. Chikitsasthana 28/33:617.
- [12] Mahajan S, Meena RR. Correlation of Tarpak Kapha and Majjavaha Srotas with cerebrospinal fluid and psychological diseases. *J Ayurveda Integr Med Sci*. 2025; 10(3): 332–337.
- [13] Acharya YT, Acharya NR. *Susrutha Samhita* of Susrutha. Reprint ed. Varanasi: Chaukhamba Orientalia; 2013: 329.
- [14] Acharya YT, Acharya NR. *Susrutha Samhita* of Susrutha. Reprint ed. Varanasi: Chaukhamba Orientalia; 2013: 328.
- [15] Acharya YT. *Charaka Samhita* of Agnivesa. Reprint ed. Varanasi: Chaukhamba Orientalia; 2009: 222.
- [16] Acharya YT. *Charaka Samhita* of Agnivesa. Reprint ed. Varanasi: Chaukhamba Orientalia; 2009: 218.
- [17] Chaturvedi A, Kumar MA, Lohith BA, Praveen BS, Swathi C, et al. Role of Ayurveda in the conservative management of avascular necrosis of the femoral head: a case study. *Anc Sci Life*. 2016; 35: 173-175.
- [18] Singh SK, et al. An Ayurveda approach in the management of avascular necrosis of femoral head (Asthimajjagata-vata). *J Ayurveda Integr Med Sci*, 2023; 100108.
- [19] Thakur C, Srivastava S. The management of Asthimajjagata Vata w.s.r. to avascular necrosis of femoral head with Ayurveda recipes – a case study. *J Ayurveda Integr Med Sci*. 2024; 9(5): 238–243.
- [20] Wells ME, Dunn JC. Pathophysiology of avascular necrosis. *Hand Clin*. 2022; 38(3):

- 277–286.
doi:10.1016/j.hcl.2022.03.004
- [21] Therokar SV, Aswathy YS, Dharmarajan P. A customized Ayurveda treatment protocol in the management of Asthimajjagata Vata (Avascular necrosis of femoral head): a case series. *Ayurveda and Alternative Medicine (AAM)*. 2025; 14(1): 79–88.
- [22] Acharya YT. *Charaka Samhita* of Agnivesa. Reprint ed. Varanasi: Chaukhamba Orientalia; 2009:149.
- [23] Singh SK, Rajoria K, Sharma S. An Ayurveda approach in the management of avascular necrosis of bilateral hip joint: a case report. *J Ayurveda Integr Med*. 2023; 14: 100792.
doi:10.1016/j.jaim.2023.100792
- [24] Chaturvedi A, Kumar MA, Lohith BA, Praveen BS, Swathi C. Role of Ayurveda in the conservative management of avascular necrosis of the femoral head: a case study. *Anc Sci Life*. 2016; 35(3): 173–175.
doi:10.4103/0257-7941.182593
- [25] Yadav T. Ayurvedic management of avascular necrosis: a case report. *J Clin Diagn Res*. 2024; 18(6): KD01–KD04.
doi:10.7860/JCDR/2024/11567.1892
- [26] Ghosh S, Law S. Withanolide D of *Withania somnifera* improves apoptosis in the bone marrow of leukemic murine model. *J Biomed Res Environ Sci*. 2021; 2(6): 431–438. doi:10.37871/jbres1252
- [27] Singh MM, Bhatnagar S. Clinical evaluation of Rasāyana effect of Guduchi Svarasa in apparently healthy individuals. *Int J Appl Ayurved Res*. 2019; 4(3): 260–264.
- [28] Panda AK, Dixit M, Rout SP, et al. Rational use of Ashwagandha in Ayurveda (Traditional Indian Medicine) for health and healing – a review. *J Ethnopharmacol*. 2021; 276: 114101.
doi:10.1016/j.jep.2021.114101.

Glossary of Important Ayurvedic Terms

1. Agnidushti

Impairment or imbalance of Agni (digestive/metabolic fire).

2. Asthi Dhatu

The bone tissue, provides structure and support.

3. Basti

Medicated enema therapy, one of the Panchakarma procedures.

-
- | | |
|---|--|
| <p>4. Dhatu Kshaya
Depletion or degeneration of body tissues due to improper nourishment or chronic disease.</p> <p>5. Majja Dhatu
The bone marrow tissue responsible for nourishing bones and the nervous system.</p> <p>6. Majjavaha Srotas
The channel responsible for the production, transportation, and nourishment of Majja Dhatu (bone marrow).</p> <p>7. Majjavaha Srotodushti
Vitiation or impairment of the channels carrying bone marrow, leading to degenerative, neurological, or marrow-related disorders.</p> <p>8. Margavarodha</p> | <p>Obstruction in the body channels (Srotas).</p> <p>9. Moola Sthana
The root or primary site of a specific Srotas (channel).</p> <p>10. Rasayana
Rejuvenative or restorative therapy intended to nourish Dhatus.</p> <p>11. Srotas
Channels or pathways through which various substances flow in the body.</p> <p>12. Swedana
Sudation or fomentation therapy used to induce sweating.</p> <p>13. Vata Shamana
Therapeutic measures aimed at pacifying aggravated Vata Dosha.</p> <p>14. Viruddha Sevana
Consumption of incompatible food combinations.</p> |
|---|--|
-