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REVIEW ARTICLE

Majjagni: A Classical Ayurvedic Appraisal of Marrow Metabolism and its Pathogenetic Role in *Majja Pradoshaja Vikara*

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ABSTRACT

Introduction: In *Ayurvedic* physiology, *Majjagni* (the tissue-specific metabolic fire associated with *Majja Dhatu*) plays a critical role in the biotransformation, nourishment, and maintenance of bone marrow and neural tissues. Despite its critical significance, the precise physiological and pathological dimensions of *Majjagni*, particularly in the context of *Majja Pradoshaja Vikara,* remain under-defined within classical discourse.

Materials and Methods: A comprehensive review of classical *Ayurvedic* treatises and standard reference texts was undertaken to delineate the *Ayurvedic* understanding of *Majjagni*. Descriptive analysis and thematic synthesis were employed to interpret its role in tissue metabolism and disease causation.

Discussion: The review highlights *Majjagni* as a key determinant in sustaining *Majja Dhatu* homeostasis, supporting structural integrity, immunity, and neural function. Aberrations in *Majjagni* lead to the onset of *Majja Pradoshaja Vikara*, characterized by either pathological accumulation or depletion of marrow tissue, resulting in systemic and neuromuscular dysfunction. Classical *Ayurvedic* text also attributes a stimulatory role to *Vata*, which aligns conceptually with modern neuroendocrine regulation. Interpretive correlations with pituitary-adrenal hormones and hematopoietic modulators underscore *Ayurveda's* sophisticated recognition of the neuroendocrine-immune dynamics governing marrow metabolism.

Conclusion: However, the lack of explicit diagnostic criteria for *Majjagni*-mediated pathologies remains a key limitation, warranting further research to refine its clinical assessment and enhance its relevance within *Ayurvedic* diagnostics and therapeutic frameworks.

1. INTRODUCTION

1.1. Background

Ayurveda, the traditional medical system of India, describes metabolism in terms of *Agni* (biological fire), which operates at multiple levels. Beyond the central digestive fire, i.e., *Jatharagni*, *Ayurveda* postulates *Dhatvagni* – metabolic fires specific to each *Dhatu* (tissue).[1,2] *Majjagni* is the *Dhatvagni* of *Majja Dhatu*, the sixth tissue in the classical hierarchy of seven *Dhatu*. The term *Majja* literally means "marrow," and classical sources interpret it as the substance filling the bone cavities, including both bone marrow and the substance of the brain and spinal cord.[3-5] Thus, *Majja Dhatu* encompasses the central nervous system and the hematopoietic marrow, making it a tissue of prime importance for both structural support and neurological function.

In *Ayurvedic* physiology, *Majjagni* is responsible for the proper formation and nourishment of *Majja Dhatu*. As the nutritive continuum of *Ahara Rasa* is progressively digested and assimilated, the precursor fractions of preceding *Asthi Dhatu* possessing inherent potential for *Majja* synthesis are acted upon by *Majjagni*, facilitating the formation and nourishment of *Majja Dhatu*.[6,7] Thus, *Majjagni* can be understood as the aggregate of metabolic processes that create, maintain, and regulate the *Majja Dhatu,* which can be correlated with bone marrow and related neural tissues.

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Although *Majjagni* is acknowledged as a vital component in *Ayurvedic* physiology, its explicit role in regulating *Majja Dhatu* and mediating the pathogenesis of *Majja Pradoshaja Vikara* remains insufficiently articulated in classical discourse. While existing *Ayurvedic* literature alludes to its influence through descriptive symptomatology and inferred functions, a systematic exposition of its physiological mechanisms, pathological deviations, and diagnostic markers is notably lacking, warranting focused analytical inquiry within the *Ayurvedic* framework.

1.2. Aim

This review aims to critically explore the regulatory role of *Majjagni* in maintaining the physiological equilibrium of *Majja Dhatu* and its pathological alterations, with particular emphasis on its role in the etiology and progression of *Majja Pradoshaja Vikara*.

2. MATERIALS AND METHODS

2.1. Data Sources

A comprehensive review was conducted through a systematic examination of primary *Ayurvedic* compendia, including the *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya*, along with authoritative commentaries, standard reference texts, and peer-reviewed journals in the domain of *Ayurveda*.

3. LITERATURE REVIEW

3.1. *Majjagni* and *Majja Dhatu* Metabolism in *Ayurvedic* Perspective

In classical *Ayurvedic* physiology, *Majjagni* is conceptualized as the metabolic fire specific to *Majja Dhatu*, embodying the *Agneya* quality inherent to *Pitta Dosha*. It governs the biotransformation, nourishment, and maintenance of the functional integrity of *Majja Dhatu*. Each *Dhatvagni* operates exclusively within its anatomical and functional territory, which is termed as *Dhatuvaha Srotas*. Accordingly, *Majjagni* exerts its action within the *Majjavaha Srotas*, the physiological channels that mediate the transport, assimilation, and metabolism of *Majja Dhatu*.

The sequential transformation of nutrients into *Majja Dhatu* is described through a hierarchical multistage process beginning with the digestion of ingested food and culminating in tissue-specific assimilation. Nutrient substrates, particularly the *Sneha Rasa* (lipid-rich essence) derived from *Ahara Rasa* and the precursor fractions from the preceding *Asthi Dhatu*, undergo progressive refinement under the influence of *Majjagni*. *Majjagni* acts at the final stage of this metabolic cascade, orchestrating the final biotransformation of these substrates into fully mature *Majja Dhatu*.

This process unfolds sequentially through distinct stages of *Agni*-mediated transformation. Following the completion of *Jatharagni Paka* (primary digestion in the gastrointestinal tract), the partially digested nutrients are subjected to *Bhutagni Paka*.[8] In this phase, the *Vijatiya* (non-self) raw nutrient substances are metabolized into *Sajatiya* (organism-specific) precursors, rendering them compatible for incorporation into the host's tissues.[9] These precursors are then further acted upon by respective *Dhatvagni* during the phase known as *Dhatu Paka*.

In *Ayurvedic* terms, *Dhatu Paka* signifies the replenishment, maintenance, and revitalization of tissues within their respective *Srotas*. Each *Dhatu* possesses its own independent metabolic channel, which serves as the principal locus of its transformation. These *Srotas* are anatomically structured with two ends – one of which is anchored in the gastrointestinal mucosa, allowing for the selective delivery of *Ahara Rasa* to the tissue level via systemic circulation and targeted *Srotas* entry. At this site resides the in-situ *Dhatvagni*, which governs the bioconversion of *Ahara Rasa* into tissue-specific elements, thereby sustaining the dynamic integrity of each *Dhatu*.

This hierarchical transformation illustrating the sequential interplay of metabolic processes governed by distinct forms of *Agni*, ultimately culminating in the formation and nourishment of *Majja Dhatu*, is schematically represented in Figure 1.[10]

3.2. Outcomes of *Majjagni Paka*

During *Majjagni Paka*, nutrients are subjected to two types of *Paka* – *Prasada Paka* and *Kitta Paka*.[11] Further, in *Prasada Paka,* three-fold bioconversion takes place. The finished products of *Majjagni Paka* are illustrated in Table 1.

4. DISCUSSION

4.1. Role of *Majjagni* in Optimal Health

Classical *Ayurvedic* texts underscore the pivotal role of *Majjagni* in maintaining the functional integrity of *Majja Dhatu*, which encompasses bone marrow and neural elements. An optimally functioning *Majjagni* ensures the adequate formation, nourishment, and maintenance of *Majja Dhatu*, thereby supporting skeletal integrity, immunological resilience, and neurological stability. When in a state of balance, *Majjagni* facilitates the efficient transformation of nutritional substrates, endowing *Majja Dhatu* with the ability to perform its physiological functions, namely *Bala* (physical strength and endurance), *Sneha* (unctuousness and lubrication), and *Asthi Purana* (filling and supporting the bone cavity).[12] According to *Charaka Samhita*, individuals with well-nourished *Majja Dhatu* exhibit soft organs, unctuous complexion, resonant voice, and prominent, well-formed joints that signify the plenitude and vitality of marrow within the skeletal framework.[13] *Sushruta* further affirms that nourished *Majja* is instrumental in imparting strength while contributing to cognitive and sensory stability. In contemporary physiological terms, such descriptions align with optimal bone marrow function, characterized by adequate hematopoiesis and healthy immune response. The *Ayurvedic* association of *Majja* with nerve tissue implies a functional correlation with myelin production, neurotransmitter regulation, and neural conductivity, thus reinforcing the view that balanced *Majjagni* underpins both physical vitality and neurological coherence.

4.2. Aberrations of *Majjagni: Majja Vriddhi, Majja Kshaya,* and *Majja Pradoshaja Vikara*

Conversely, aberrant *Majjagni* activity is implicated in a spectrum of pathologies collectively termed *Majja Pradoshaja Vikara*, manifesting either as *Majja Dhatu Vriddhi* or *Kshaya*, each associated with distinct clinical sequelae.[14] Hypoactive *Majjagni* may lead to the pathological accumulation of unctuous *Majja*, manifesting as corporeal heaviness, joint edema, and lethargy, while its hyperactivity causes excessive depletion, leading to porosity of bones, neuro-muscular debility (e.g., dizziness and tremors), and compromised immunity. These descriptions illustrate *Ayurveda's* nuanced understanding of marrow metabolism, aligning with contemporary insights into metabolic and neurodegenerative disorders.

Table 2 delineates the characteristic features associated with *Majjagni Samata* (balanced state), *Majjagni Mandata* (hyperactivity), and *Majjagni Tikshnata* (hyperactivity), as described in classical *Ayurvedic* literature.[15]

4.3. Pathophysiology of *Majjagni Vikara* or *Majja Pradoshaja Vikara*

The pathogenesis of *Majja Pradoshaja Vikara* is initiated by sustained exposure to causative factors that compromise primary digestion and systemic metabolic assimilation. This impairment leads to the accumulation of toxic intermediates and partially metabolized nutrient substrates, which disseminate through the circulation and are preferentially deposited within the *Majjavaha Srotas*. This localized accumulation disrupts the functional integrity of *Majjagni*, thereby triggering a pathological cascade that culminates in the clinical manifestation of *Majja Pradoshaja Vikara*.[16] The sequential stages of this pathophysiological process are delineated in the following Figure 2.

4.4. Interpretive Insights on Neuro-endocrinal Regulation of *Majjagni*

Interestingly, *Ayurveda* also attributes a regulatory influence of *Vata Dosha* on *Majjagni*. Owing to its anatomical association with the nervous system, *Majja Dhatu* is considered intimately linked with *Vata*. One classical text describes that certain *Vayavya* (kinetic) forces stimulate *Majjagni*, thereby ensuring optimal metabolic activity within *Majja*.

In a noteworthy interpretive extrapolation, these *Vata*-associated factors have been linked to the endocrine secretions of the pituitary and adrenal glands, along with Vitamin C. Hormonal mediators from the pituitary and adrenal glands are proposed to act as dynamic stimuli that facilitate the conversion of *Medogata Sneha* into functional *Majja*, whereas Vitamin C, known for its critical role in hematopoiesis, is believed to invigorate *Majjagni*, thereby enhancing marrow metabolism. Although these identifications stem from modern interpretive frameworks, they reflect a compelling conceptual alignment between *Ayurvedic* notions of *Vata* and the neuroendocrine regulation of tissue metabolism.

5. CONCLUSION

The present review reaffirms the pivotal role of *Majjagni* in governing the physiological and pathological states of *Majja Dhatu*, highlighting its influence on skeletal strength, immune function, and neurological coherence. Classical *Ayurvedic* descriptions of *Majjagni* dysfunction align remarkably with the contemporary understanding of bone marrow insufficiency, immune dysregulation, and neurodegenerative states. Despite these correlations, a major limitation remains the lack of explicit diagnostic parameters and standardized clinical markers within the *Ayurvedic* framework. Future investigations integrating classical insights with emerging methods in *Ayurvedic* diagnostics may contribute to a more precise and applicable understanding of *Majjagni*-mediated pathologies, with significant implications for both preventive and therapeutic strategies in *Ayurvedic* clinical practice.

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This study does not require ethical approval as it is a review study.

10. CONFLICTS OF INTEREST

Nil.

11. DATA AVAILABILITY

This is an original manuscript and all data are available for only review purposes from principal investigators.

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REFERENCES

1. Malviya A, Shakya J, Pandey PK, Palsedkar R. Study of Agni in different metabolic disorders- a review. World J Pharm Sci Res. 2023;2(2):1-10.
2. Trikamji Y, editor. Charaka samhita of agnivesha, chikitsa sthana; Grahanidosha chikitsa adhyaya. (Chakrapani tika). Ch. 15., Ver. 38. Varanasi: Chaukhambha Orientalia; 2015. p. 516.
3. Patel V, Sasmal G, Kumar A. The concept of majja dhatu. World J Pharm Res. 2020;9(2):335-40. doi: 10.20959/wjpr20202-16614
4. Trikamji Y, editor. Sushruta samhita of sushruta, sharira sthana; Garbhavyakarana sharira adhyaya. Ch. 4., Ver. 12-13. Varanasi: Chaukhambha Orientalia; 2015. p. 356.
5. Shivprasad Sharma, editor. Ashtanga samgraha of vriddha vagbhata, Sharira sthana; Angavibhaga adhyaya. Ch. 5., Ver. 33. Varanasi: Chowkhamba Sanskrit Series Office; 2012. p. 302-3.
6. Trikamji Y, editor. Charaka samhita of agnivesha, chikitsa sthana; Grahanidosha chikitsa adhyaya. Ch. 15., Ver. 16. Varanasi: Chaukhambha Orientalia; 2015. p. 514.
7. Trikamji Y, editor. Sushruta samhita of sushruta, sutra sthana; Shonitavarnaniya adhyaya. Ch. 14., Ver. 10. Varanasi: Chaukhambha Orientalia; 2015. p. 60.
8. Trikamji Y, editor. Charaka samhita of agnivesha, chikitsa sthana; Grahanidosha chikitsa adhyaya. (Chakrapani tika). Ch. 15. Ver. 13. Varanasi: Chaukhambha Orientalia; 2015. p. 513.
9. Trikamji Y, editor. Charaka samhita of agnivesha, chikitsa sthana; Grahanidosha chikitsa adhyaya. (Chakrapani Tika). Ch. 15., Ver. 14. Varanasi: Chaukhambha Orientalia; 2015. p. 514.
10. Niranjandev ayurvedalankara. Prakruta agni vigyana. Prakruta dhatvagni vimarsha, majjagni adhayaya. Sec. 4. Lucknow: Ayurvedic Evam Tibbi Academy; 1974. p. 217.
11. Trikamji Y, editor. Charaka samhita of agnivesha, chikitsa sthana; Grahanidosha chikitsa adhyaya. (Chakrapani Tika). Ch. 15., Ver. 15. Varanasi: Chaukhambha Orientalia; 2015. p. 514.
12. Trikamji Y, editor. Sushruta samhita of sushruta, sutra sthana; Dosha-dhatu-mala-kshayavriddhi viganiya adhyaya. Ch. 15., Ver. 5.

Varanasi: Chaukhambha Orientalia; 2015. p. 67-8.
13. Trikamji Y, editor. Charaka samhita of agnivesha, vimana sthana; Rogabhisagjitiya adhyaya. Ch. 8., Ver. 108. Varanasi: Chaukhambha Orientalia; 2015. p. 278.
14. Paradakara HS, Editor. Ashtanga hridaya of vagbhata, sutra sthana; Doshahiviganiya adhyaya. Ch. 11., Ver. 34. Varanasi: Chaukhambha Orientalia; 2019. p. 188.
15. Shastri H. Dehadhatvagni vigyanam. Appendix 1. Delhi: Motilal Banarasidas Publications; 1977. p. 198-9.
16. Shastri H. Dehadhatvagni vigyanam. Ch. 11. Delhi: Motilal Banarasidas Publications; 1977. p. 100-2.

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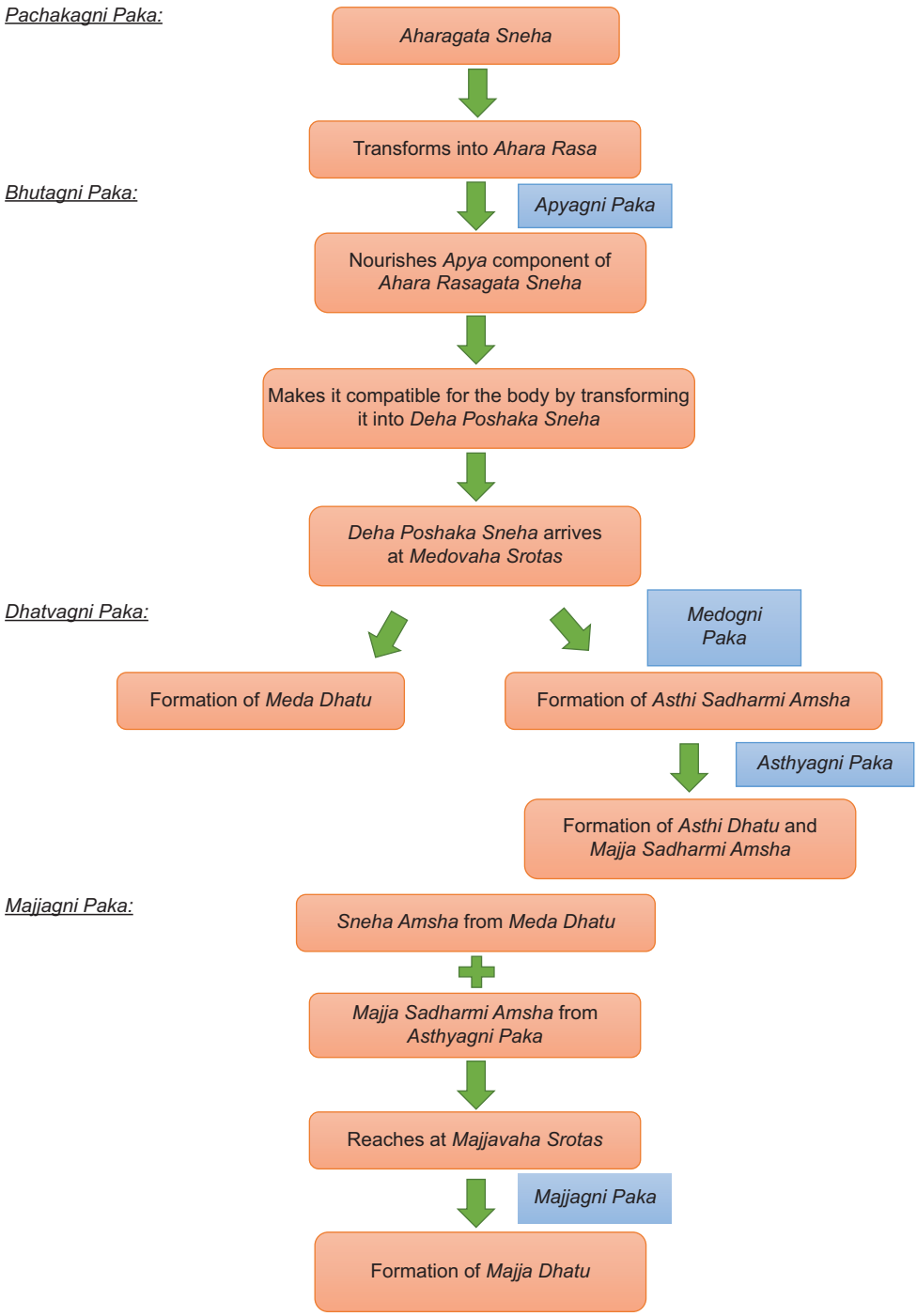

Figure 1: Illustration of sequelae of *Majjagni Paka*

Table 1: Finished products of *Majjagni Paka*

Prasada Paka		***Kitta Paka***
Sthoola Bhaga	***Sukshma Bhaga***	
• Formation of *Asthayi Majja Dhatu*	• Formation of *Kesha* (*Upadhatu* of *Majja*) • Formation of *Shukra Sadharmi Amsha* (Precursor for *Shukra Dhatu*)	• Formation of *Dhatu Mala*, namely *Tvak Sneha, Akshi Sneha* and *Vit Sneha*

Table 2: Features of *Majjagni Samata, Majjagni Mandata* and *Majjagni Tikshnata*

Majjagni Samata	***Majjagni Mandata***	***Majjagni Tikshnata***
1. *Asthisnigdhata*	1. *Sarvanga Gauravam*	1. *Nadi Shula*
2. *Snigdhangata*	2. *Netra Gauravam*	2. *Parva Bheda*
3. *Bala*	3. *Netra Shuklata*	3. *Asthi Nistoda*
4. *Shukra Pushti*	4. *Parva Sthoolata*	4. *Asthi Shula*
5. *Asthi Purana*	5. *Parvasu Sthoolamulagandani*	5. *Sandhi Shula*
6. *Asthi Dardhaya*	6. *Parvasu Vrana*	6. *Asthishunyata*
7. *Uttama Raktadhatutvam*	7. *Parvashotha*	7. *Rakta Dhatu Kshaya*
8. *Nadiyantrabalam*	8. *Parvagauravam*	8. *Alpashukrata*
	9. *Nadi Shotha*	9. *Mastishkapchaya*
	10. *Nadi Pradaha*	10. *Asthi-Majja Prapaka*
	11. *Parva Shulam*	11. *Haridra Nakha*
	12. *Mastishkachaya*	12. *Haridra Netrata*
		13. *Asthi-Majja Vidhradhi*
		14. *Shira Shula*
		15. *Gambhira Asthi Pradaha*
		16. *Bhrama*
		17. *Daurbalaya*
		18. *Nadi Kshaya*

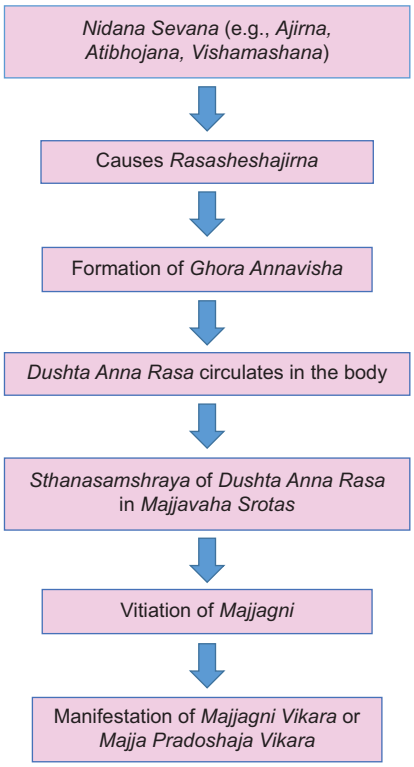

Figure 2: Schematic representation of pathogenesis of *Majja Pradoshaja Vikara*