



Review Article

www.ijrap.net

(ISSN Online:2229-3566, ISSN Print:2277-4343)



AGNI AND INFERTILITY: A NARRATIVE REVIEW WITH SPECIAL REFERENCE TO STRESS-INDUCED CHANGES IN THE HYPOTHALAMIC-PITUITARY-GONADAL AXIS

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Received on: 30/5/26 Accepted on: 02/7/26

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DOI: 10.7897/2277-4343.174150

ABSTRACT

In Ayurveda, Garbha Siddhi (successful conception) is understood as the result of the appropriate interaction of Ritu (appropriate fertile period), Kshetra (healthy reproductive organs), Ambu (adequate nourishment), and Beeja (healthy sperm and ovum). In the present context, infertility is increasingly associated with psychological stress, disturbed metabolic status, and changing lifestyle patterns. Contemporary biomedical science explains stress-induced infertility primarily through dysregulation of the hypothalamic-pituitary-gonadal axis. In contrast, Ayurveda places Agni (digestive fire) at the center of metabolic regulation, governing digestion, transformation, and tissue nourishment, thereby influencing overall physiological balance and homeostasis. The present study is a qualitative conceptual review based on classical Ayurvedic literature and relevant modern scientific publications. An integrative approach was adopted to examine the relationship between Agni, metabolic processes, and reproductive function. Psychological stress induces neuroendocrine alterations that interfere with hormonal balance and reproductive health. From an Ayurvedic perspective, Manasika (psychological) factors such as stress impair Agni, leading to the formation of Ama (toxins), obstruction of Srotas (channels), and derangement of Dhatu (tissue) nourishment. These changes adversely affect the quality and function of Shukra (sperm) and Artava (ovum), which are essential for conception. Such disturbances may be correlated with dysfunction of the hypothalamic-pituitary-gonadal axis, including altered secretion of gonadotropins. Within this framework, Agni may be understood as a functional link between metabolic integrity and endocrine regulation. Agni plays a crucial role in maintaining the metabolic and physiological conditions necessary for Garbha Siddhi. Its impairment, particularly under the influence of psychological stress, may contribute to infertility through interconnected metabolic and neuroendocrine mechanisms. This perspective supports a more comprehensive approach to infertility by addressing both metabolic balance and psychological well-being.

Keywords: Agni, Agnimandya, Ama, Hypothalamic-Pituitary-Gonadal Axis, Infertility, Stress

INTRODUCTION

Infertility has emerged as a significant global health concern, with increasing prevalence attributed to lifestyle disorders, environmental factors, and psychological stress. According to the WHO, nearly 17.5% of the adult population worldwide experiences infertility, affecting approximately one in six individuals globally. Contemporary biomedical research identifies chronic stress as a major factor impairing reproductive function through disruption of the hypothalamic-pituitary-gonadal (HPG) axis, resulting in hormonal imbalance and impaired gametogenesis.

Ayurveda presents a holistic understanding of fertility, wherein Garbha Siddhi (successful conception), as described by Acharya Sushruta, depends on the proper synergy of Ritu (appropriate fertile period), Kshetra (healthy reproductive organs), Ambu (adequate nourishment and a fluid environment), and Beeja (healthy ovum and sperm).¹ These fundamental prerequisites for conception are intricately governed by the functional integrity of Agni Mahabhuta (fire element). In Ayurveda, Agni is regarded as the sustaining principle for life, and its cessation is considered synonymous with the termination of vital processes.²

The physiological influence of Agni extends across multiple levels of bodily function, including digestion, transformation, assimilation, and tissue nourishment. Agni also contributes to the development of Buddhi (intellect)³ during the sixth month of Garbha Masanumashika Vridhi Karma (monthly growth of the fetus), as described by Acharya Sushruta.⁴ Proper digestion and assimilation of maternal nutrients ensure adequate Dhatu formation and maintenance of physiological homeostasis.⁵ When Agni remains in a balanced state, it supports the formation of healthy reproductive tissue essential for fertility. Conversely, impairment of Agni leads to metabolic disturbances that may result in infertility.⁶ Despite advancements in reproductive medicine, integration of metabolic and psychological dimensions in understanding infertility remains limited. Therefore, a comprehensive framework bridging Ayurvedic and modern scientific perspectives is required. The present review attempts to analyse the role of Agni in infertility and correlate it with stress-induced dysregulation of the HPG axis.

This review is based on a comprehensive analysis of Ayurvedic concepts related to Agni, Ama, Dhatu formation, and reproductive physiology, derived from primary classical sources, including the Charaka Samhita and the Sushruta Samhita. Modern scientific literature pertaining to stress physiology, hypothalamic-pituitary-gonadal axis regulation, and infertility was collected

from peer-reviewed journals and academic databases. The collected data were critically analysed and synthesised to develop an integrative conceptual framework correlating Ayurvedic principles with contemporary biomedical understanding.

DISCUSSION

The present review attempts to bridge two epistemologically distinct yet conceptually convergent systems- Ayurveda and modern neuroendocrinology- by positioning Agni as a central regulator of reproductive competence in stress-induced infertility. Contemporary biomedical literature primarily attributes stress-associated infertility to dysregulation of the hypothalamic-pituitary-gonadal (HPG) axis, largely mediated by overactivation of the hypothalamic-pituitary-adrenal (HPA) axis.⁷ However, this explanation remains predominantly axis-centric, focusing mainly on hormonal pathways rather than systemic physiological integration. In contrast, Ayurveda provides a broader and more integrative understanding of physiology, in which Agni governs digestion, transformation, tissue differentiation, and functional integrity across multiple biological levels. Within this paradigm, Agni may be interpreted as a key regulatory principle linking metabolism, neuroendocrine coordination, and psychophysiological balance.

A key conceptual insight emerging from this analysis is that Agnimandya (weakened digestive fire) may be interpreted as a state of metabolic-neuroendocrine dysregulation. Under physiological conditions, nutrient availability, energy balance, and endocrine signalling function in coordinated harmony to maintain reproductive competence. Chronic stress disrupts this coordination by prioritising survival mechanisms over reproductive processes, primarily through cortisol-mediated suppression of gonadotropin-releasing hormone (GnRH) pulsatility.⁸ From an Ayurvedic perspective, this disruption may be understood as Manasika Dosha (psychological factors) vitiation leading to impairment of Agni, thereby compromising Dhatu nourishment and promoting the formation of Ama (toxic metabolites).⁹ The resultant qualitative and quantitative depletion of Shukra and Artava closely parallels modern observations such as impaired gametogenesis, follicular arrest, and luteal phase defects. Therefore, Agnimandya should not be interpreted merely as a digestive disturbance but rather as a systemic impairment of metabolic signalling with direct implications for HPG axis functionality.

Another important dimension concerns the role of Ama, which is described in Ayurveda as a toxic, incompletely metabolised substance that can obstruct Srotas and disrupt physiological processes.¹⁰ From a contemporary biomedical perspective, Ama may be correlated with chronic low-grade inflammation, oxidative stress, and circulating metabolic endotoxins.¹¹ These factors are increasingly recognised as major contributors to reproductive dysfunction. Experimental evidence suggests that inflammatory cytokines and reactive oxygen species can impair hypothalamic regulation, alter pituitary responsiveness, and disrupt gonadal steroidogenesis.¹² This provides a mechanistic parallel to the Ayurvedic concept of Srotorodha (obstruction of channels), wherein obstruction of biological channels interferes not only with nutrient transport but also with signalling pathways necessary for endocrine homeostasis.

Within this Agni-centred framework, the role of Vata Dosha may be understood as secondary yet functionally significant. Vata governs movement and communication within the body, including neural transmission and hormonal signalling.¹³ Disturbances in Agni may subsequently lead to Vata Vaigunya (vitiation), manifesting as irregularities in neuroendocrine

rhythms, including altered GnRH pulsatility observed in HPG axis dysfunction.¹⁴ However, the functional disturbance of Vata remains dependent upon the primary impairment of Agni.

This integrative perspective suggests that infertility should not be viewed solely as a localised reproductive disorder but rather as a systemic condition involving interconnected metabolic, neuroendocrine, and psychological factors. It further highlights that stress-induced reproductive dysfunction cannot be completely understood without considering the underlying metabolic disturbances governed by Agni. Ayurvedic interventions aimed at restoring Agni through Deepana-Pachana, eliminating Ama, pacifying Vata, and improving systemic balance may therefore provide a root-cause-oriented therapeutic framework. Additionally, incorporation of stress-modulating practices such as Yoga, meditation, and Pranayama offers scientifically supported mechanisms for regulating HPA axis activity and restoring HPG axis balance. This highlights the potential utility of an integrative, multidimensional approach to the management of infertility.

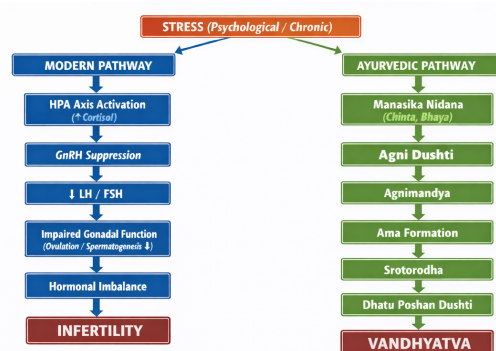


Figure 1: Comparative Pathophysiology of Stress-Induced Infertility from Ayurvedic and contemporary biomedical perspectives.

CONCLUSION

Infertility should be understood as a systemic disorder involving the interplay of metabolic, neuroendocrine, and psychological factors rather than an isolated reproductive dysfunction. The present review highlights that Agni plays a central role in maintaining metabolic integrity and reproductive competence. Impairment of Agni (Agnimandya) leads to Ama formation, Srotorodha, and defective Dhatu nourishment, ultimately affecting Shukra and Artava.

These alterations closely correspond to inflammatory and metabolic disturbances described in contemporary biomedical science. Chronic stress further contributes to infertility through activation of the hypothalamic-pituitary-adrenal axis and suppression of the hypothalamic-pituitary-gonadal axis, resulting in hormonal imbalance and impaired reproductive function. Within the Ayurvedic framework, this reflects Dosha vitiation, Agnimandya, and Ama formation.

Thus, based on the available evidence, Agni may be conceptualised as a functional bridge between metabolism and neuroendocrine regulation in stress-induced infertility. An integrative approach that focuses on Agni restoration, Ama elimination, and stress modulation may offer a comprehensive strategy to improve reproductive outcomes. Further interdisciplinary research is required to validate these correlations and support evidence-based integrative management of infertility.

REFERENCES

1. Shastri AD, editor. Sushruta Samhita. Part 1. Reprint ed. Varanasi: Chaukhamba Sanskrit Sansthan; 2021. Sarira Sthana 2/35, p. 19.
2. Charaka. In: Shastri K, Chaturvedi G, editors. Charaka Samhita. Part 2. Varanasi: Chaukhamba Bharati Academy; 2012. Chikitsa Sthana 15/3-4. p. 408.
3. Kudesia R, Rajput M. Garbha Sharir: An Ayurvedic insight into embryology. *Int J Res Anal Rev.* 2025;12(2): 4.
4. Shastri AD, editor. Sushruta Samhita. Part 1. Reprint ed. Varanasi: Chaukhamba Sanskrit Sansthan; 2021. Sarira Sthana 3/28: p. 33.
5. Suryawanshi A, Sharma B. Agni in Ayurveda: A Comprehensive Review of its Role and Interrelations with Physiological Factors. *J Ayu Int Med Sci.* 2025;10(10):103-106.
6. Shetty N, Jain A. Role of Agni in Stree Vandhyatwa. *J Ayu Int Med Sci.* 2025;10(10):180.
7. Trolice MP. Linking stress and infertility-more than a chicken and egg conundrum. *J Assist Reprod Genet.* 2021;38(4):873-875. doi: 10.1007/s10815-021-02145-w.
8. Joseph DN, Whirledge S. Stress and the HPA Axis: Balancing Homeostasis and Fertility. *Int J Mol Sci.* 2017 Oct 24;18(10):2224. doi: 10.3390/ijms18102224.
9. Sharma P, Sharma N. The role of Agni in disease pathogenesis: An Ayurvedic perspective. *Int J Innov Res Technol.* 2025;11(10):1.
10. Lad V. Textbook of Ayurveda, Vol. 1: Fundamental principles. Ayurvedic Press; 2002
11. Bhat P, Udikeri M. The pathophysiology of Ama in Ayurveda: Integrating ancient metabolic toxicity with contemporary diagnostic paradigms. *Int J Res Anal Rev.* 2025;12(2):2.
12. Ignatiuk VM, Sharova VS, Zakharova LA. The role of cytokines in the development and functioning of the hypothalamic-pituitary-gonadal axis in mammals in normal and pathological conditions. *Int J Mol Sci.* 2025;26(22):11057. doi:10.3390/ijms262211057.
13. Sharma T, Meghwal CR, Prajapat M, Sharma AK. Conceptual study of Vata Dosha with special reference to nervous system. *J Ayurveda Integr Med Sci.* 2024;9(2):134-140. doi:10.21760/jaims.9.2.21.
14. Mbiydzennyuy NE, Qulu LA. Stress, hypothalamic-pituitary-adrenal axis, hypothalamic-pituitary-gonadal axis, and aggression. *Metab Brain Dis.* 2024;39(8):1613-1636. doi:10.1007/s11011-024-01393-w.

Cite this article as:

Aayushi Choudhary, Sarika Yadav and Bhanu Pratap Singh. Agni and Infertility: A narrative review with special reference to Stress-induced changes in the Hypothalamic-Pituitary-Gonadal axis. *Int. J. Res. Ayurveda Pharm.* 2026;17(4):128-130. doi: <http://dx.doi.org/10.7897/2277-4343.174150>

Source of support: Nil, Conflict of interest: None Declared

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