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NEUROENDOCRINE MODULATION THROUGH NASYA KARMA IN POLYCYSTIC OVARY SYNDROME (PCOS)

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ABSTRACT

Introduction: Polycystic Ovary Syndrome (PCOS) is a complex endocrine disorder characterized by neuroendocrine dysregulation, particularly in the hypothalamic–pituitary–ovarian (HPO) axis. Traditional Ayurvedic therapy, *Nasya Karma*, has been proposed to modulate neuroendocrine function via nasal administration of herbal oils. This study explores mechanisms by which Nasya may influence neurohormonal pathways in PCOS. **Methods:** A narrative review was conducted using classical Ayurvedic texts, recent clinical reports, and modern neuroendocrine research on PCOS. Databases included PubMed, Google Scholar, and Ayurvedic journals focusing on Nasya interventions. **Results:** Nasya Karma, through intranasal delivery, may act on olfactory and trigeminal neural pathways, influencing the central nervous system and modulating GnRH pulsatility. Herbal oils used in Nasya (e.g., Brahmi, Jatamansi, Shatavari) have adaptogenic, anti-inflammatory, and neuro-regulatory effects. Neuroendocrine studies in PCOS demonstrate elevated GnRH pulse frequency, increased kisspeptin and neurokinin B signaling, and altered neurotransmitters (GABA, glutamate, serotonin). **Discussion:** Integration of Ayurvedic and neuroendocrine perspectives suggest Nasya may restore neuroendocrine balance in PCOS by modulating upstream regulators of GnRH via KNDy neurons. This may reduce LH hypersecretion and hyperandrogenism. Case reports show potential clinical effects, though controlled trials are limited. **Conclusion:** Nasya Karma may be a promising non-pharmacological intervention for PCOS targeting neuroendocrine dysfunction. Future studies including randomized controlled trials and neurohormonal biomarker assessments are warranted.

KEYWORDS: PCOS, Nasya Karma, Neuroendocrine Modulation, GnRH Regulation.

INTRODUCTION

PCOS is one of the most prevalent endocrine disorders affecting women of reproductive age. It is characterized by ovulatory dysfunction, hyperandrogenism, and polycystic ovarian morphology (Szeliga et al., 2022).[1] Neuroendocrine dysregulation, particularly increased pulsatility of gonadotropin-releasing hormone (GnRH), is central to PCOS pathophysiology.

Current medical treatments mainly manage symptoms (e.g., hormonal suppression, metabolic regulation) rather than the underlying neuroendocrine imbalance (Szeliga et al., 2022).[1]

Ayurveda proposes *Nasya Karma* — administration of medicated oils via the nasal route — as a therapy to influence central nervous system function and hormonal balance. Classical texts state: *"Nasa hi shirso dvāram"* ("the nose is the doorway of the head") (Meher et al., 2025).[2] Recent Ayurvedic studies suggest Nasya may be effective in managing hormonal imbalance in gynecological disorders, including PCOS (Kumari et al., 2019; Post et al., 2023).[3,4]

This article integrates neuroendocrine science and Ayurvedic theory to present a model of how Nasya Karma may modulate neurohormonal circuits in PCOS.

METHODS

A narrative integrative review was performed. Electronic databases (PubMed, Google Scholar) were searched for studies on:

1. Neuroendocrine mechanisms in PCOS.
2. Nasya Karma for hormonal or gynecological disorders.

Classical Ayurvedic sources and recent clinical studies were analyzed to synthesize evidence on Nasya's neuroendocrine effects.

RESULTS

Neuroendocrine Pathophysiology in PCOS

- **GnRH Pulsatility and LH Hypersecretion:** PCOS is associated with increased GnRH pulse frequency, leading to excessive LH relative to FSH, disrupting follicular development.[1]
- **KNDy Neurons:** Kisspeptin/neurokinin B/dynorphin neurons regulate GnRH secretion. Dysregulation in these neurons contributes to PCOS neuroendocrine abnormalities.[1]
- **Neurotransmitter Imbalance:** GABA, glutamate, serotonin, and dopamine modulate GnRH. Altered neurotransmission is observed in PCOS.[1]
- **Neuroendocrine Androgen Action:** Neuronal androgen receptor signaling contributes to hyperandrogenism in PCOS.[5]

Ayurvedic Perspective and Mechanism of Nasya

- **Theoretical Basis:** Ayurvedic texts suggest dosha imbalances (Kapha and Vata) disturb HPO axis function. Nasya is considered a key therapy for neurohormonal regulation.[2]
- **Intranasal CNS Access:** The nasal mucosa connects to the brain via olfactory and trigeminal nerves, allowing direct modulation of CNS centers controlling hormones.[3]

- **Herbal Formulations:** Nasya oils often include Brahmi, Jatamansi, Shatavari, and Shatpushpa, which possess neuro-modulatory and adaptogenic properties.[2,6]
- **Clinical Evidence:** Case reports show improvement in ovulation and hormonal balance following Nasya Karma in PCOS patients.[4]

Integrated Mechanism

1. Nasya delivers herbal actives via nasal pathways → CNS influence (olfactory bulb, hypothalamus).
2. Modulation of KNDy neurons stabilizes GnRH pulsatility.
3. Balanced LH/FSH secretion restores follicular development and reduces hyperandrogenism.
4. Herbs may regulate neurotransmitters (GABA, serotonin) enhancing neuroendocrine stability.
5. Neuroendocrine homeostasis supports ovulatory and metabolic improvements.

DISCUSSION

Nasya Karma may provide a mechanism-based approach to modulate neuroendocrine dysfunction in PCOS. By targeting upstream GnRH regulators, Nasya could address the root cause rather than just symptoms. Case reports (Post et al., 2023) support its potential efficacy. However:

- RCTs evaluating Nasya in PCOS with neurohormonal biomarkers are lacking.
- Pharmacokinetics and bioavailability of nasally administered herbal oils are not fully understood.
- Standardization of formulations and dosing is required for reproducibility.

Despite these limitations, Nasya is conceptually promising, especially as an integrative or adjunctive therapy for women seeking low-side-effect interventions.

CONCLUSION

Nasya Karma may normalize neuroendocrine pathways in PCOS, particularly GnRH pulsatility and LH/FSH balance. Future research should focus on:

- Randomized controlled trials with hormonal and neurobiological endpoints.
- Pharmacokinetic studies of nasya oils.
- Standardization and safety protocols.

If validated, Nasya could become an integral part of holistic PCOS management alongside lifestyle modifications and conventional therapies.

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