

Herbal Therapies for Hyperprolactinemia: Current Evidence and Future Directions

Chelimo Faith Rebecca

Department of Clinical Medicine and Dentistry Kampala International University Uganda

Email: rebecca.chelimo@studwc.kiu.ac.ug

ABSTRACT

Hyperprolactinemia, a disorder characterized by excessive serum prolactin levels, can result in reproductive dysfunction, menstrual irregularities, galactorrhea, and infertility. While dopamine agonists such as bromocriptine and cabergoline are the standard treatments, they are often associated with side effects, prompting interest in herbal alternatives. Herbal therapies, including *Vitex agnus-castus*, *Withania somnifera*, *Glycyrrhiza glabra*, *Paeonia lactiflora*, and *Camellia sinensis*, have shown promise in modulating prolactin levels through dopaminergic activity, hypothalamic-pituitary-adrenal (HPA) axis regulation, and antioxidative mechanisms. These phytotherapeutic agents may offer a safer and more holistic approach to managing hyperprolactinemia. However, clinical evidence remains limited, with most studies being preclinical or small-scale trials. Standardization of herbal preparations, determination of optimal dosages, and comprehensive safety evaluations are necessary to establish their clinical efficacy. Future research should focus on large-scale randomized controlled trials and mechanistic studies to elucidate their roles in prolactin regulation. This review highlights the potential of herbal therapies as adjunctive or alternative treatments for hyperprolactinemia and underscores the need for further scientific validation.

Keywords: Hyperprolactinemia, herbal medicine, dopamine agonists, *Vitex agnus-castus*, endocrine modulation

INTRODUCTION

Hyperprolactinemia is a disorder characterized by excessive secretion of prolactin by the anterior pituitary gland [1]. Prolactin, a hormone primarily responsible for lactation, also plays a crucial role in reproductive function, immune regulation, and metabolism [2]. Elevated prolactin levels can result from physiological conditions such as pregnancy, stress, and lactation, as well as pathological causes including pituitary adenomas (prolactinomas), hypothyroidism, chronic kidney disease, and certain medications (e.g., antipsychotics, antidepressants, and antihypertensives) [3]. Hyperprolactinemia disrupts gonadal function by inhibiting gonadotropin-releasing hormone (GnRH) secretion, leading to reduced luteinizing hormone (LH) and follicle-stimulating hormone (FSH) levels. This suppression contributes to hypogonadism, menstrual irregularities, galactorrhea, decreased libido, erectile dysfunction, and infertility in both men and women [4]. Dopamine agonists, such as bromocriptine and cabergoline, remain the first-line treatment for

hyperprolactinemia due to their ability to suppress prolactin secretion by stimulating dopamine D₂ receptors in the pituitary. While effective, these drugs are associated with side effects including nausea, dizziness, hypotension, and, in some cases, impulse control disorders [5,6]. Additionally, some patients exhibit resistance or intolerance to dopamine agonists, necessitating alternative therapeutic approaches [7]. Herbal medicine has gained increasing attention as a potential adjunct or alternative treatment for hyperprolactinemia. Various medicinal plants contain bioactive compounds that may modulate prolactin secretion through dopaminergic activity, endocrine regulation, and anti-inflammatory mechanisms [8]. Herbal interventions offer a more natural approach with potentially fewer adverse effects, making them attractive to patients seeking integrative treatment strategies [9,10]. However, the efficacy, safety, and mechanisms of these herbal therapies remain incompletely understood. This review aims to explore

the current scientific evidence on herbal interventions for hyperprolactinemia, elucidate their mechanisms of

Herbal Remedies for Hyperprolactinemia

Several herbal compounds have been investigated for their potential role in modulating prolactin levels. These herbs contain bioactive compounds that influence dopamine activity, endocrine regulation, and oxidative stress, which are all implicated in prolactin secretion. Below, we summarize key herbs with reported efficacy [11,12].

1. *Vitex agnus-castus* (Chaste Tree Berry)

Vitex agnus-castus (VAC) is one of the most extensively studied herbs for hyperprolactinemia. It contains dopaminergic compounds such as diterpenes that act on dopamine D₂ receptors, thereby inhibiting prolactin secretion [13]. Clinical studies suggest that VAC can reduce mild hyperprolactinemia and alleviate associated symptoms such as menstrual irregularities and luteal phase defects. The herb has been widely used in traditional medicine for female reproductive health, and its prolactin-lowering effects make it a promising natural therapy for hyperprolactinemia [14].

2. *Withania somnifera* (Ashwagandha)

Ashwagandha, an adaptogenic herb, has demonstrated the ability to modulate the hypothalamic-pituitary-adrenal (HPA) axis, which may indirectly influence prolactin levels. By reducing stress and cortisol levels, ashwagandha may help regulate prolactin secretion, as chronic stress is known to elevate prolactin. Additionally, animal studies suggest its neuroprotective and hormonal balancing effects, though human data remain limited. Ashwagandha's antioxidative and anti-inflammatory properties further support its role in endocrine homeostasis [15].

3. *Glycyrrhiza glabra* (Licorice Root)

Licorice root contains glycyrrhizin, a bioactive compound that influences pituitary function and steroid metabolism. However, its effects on prolactin are contradictory. Some studies suggest that licorice increases prolactin levels by inhibiting dopamine

action, and highlight future research directions to optimize their therapeutic potential.

metabolism, while others propose that its anti-inflammatory properties may indirectly contribute to hormonal balance [16]. Due to these conflicting findings, further research is required to determine its therapeutic potential in hyperprolactinemia.

4. *Paeonia lactiflora* (Peony Root)

Peony root is widely used in traditional Chinese medicine for the treatment of hormonal disorders. It contains paeoniflorin, a bioactive compound that modulates dopamine receptors and may contribute to prolactin suppression. Studies indicate that peony root, particularly in combination with licorice root, can help regulate ovarian function and reduce hyperprolactinemia-related symptoms [17]. The herb's ability to modulate steroid hormone biosynthesis and its anti-inflammatory properties further support its role in endocrine regulation.

5. *Camellia sinensis* (Green Tea)

Green tea is rich in polyphenols, particularly catechins, which exhibit antioxidative and neuroprotective properties. While green tea has not been directly studied for hyperprolactinemia, its impact on endocrine modulation suggests potential benefits. Catechins may help regulate oxidative stress and inflammation, which are contributing factors to endocrine dysfunction. Additionally, green tea has been found to support metabolic and hormonal balance, making it a candidate for further investigation in the context of prolactin regulation [18,19]. Herbal remedies offer a promising avenue for managing hyperprolactinemia, particularly for individuals seeking alternative or adjunctive treatments. While preliminary studies support their potential, further research is necessary to establish their clinical efficacy, optimal dosages, and mechanisms of action [20,21].

Mechanisms of Action

Herbal therapies influence prolactin regulation through several mechanisms:

Dopaminergic activity: Herbs such as *Vitex agnus-castus* contain bioactive compounds that mimic dopamine's inhibitory effect on prolactin secretion by stimulating dopamine D₂ receptors in the pituitary gland [22]. This reduces prolactin synthesis and helps restore hormonal balance.

Modulation of the HPA axis: Adaptogenic herbs like *Withania somnifera* help regulate the hypothalamic-pituitary-adrenal (HPA) axis, reducing cortisol levels and mitigating stress-induced prolactin elevation. Chronic stress is known to

stimulate prolactin release, making stress modulation a relevant therapeutic target [23].

Antioxidant and anti-inflammatory properties: Chronic inflammation and oxidative stress contribute to endocrine imbalances, including hyperprolactinemia. Herbs such as *Camellia sinensis* (green tea) and *Paeonia lactiflora* (peony root) contain polyphenols and flavonoids that exhibit antioxidative and anti-inflammatory effects, which may protect dopaminergic neurons and maintain endocrine homeostasis [24].

Hormonal balance and endocrine modulation: Certain herbs exert indirect effects on prolactin levels

by modulating other hormonal pathways, including estrogen, progesterone, and androgens. For example, *Glycyrrhiza glabra* (licorice root) has phytoestrogenic properties, which may influence

Clinical Evidence and Limitations

While preclinical and small-scale clinical studies suggest promising effects of herbal therapies on hyperprolactinemia, high-quality, large-scale randomized controlled trials (RCTs) are lacking [26]. Many studies focus on individual herbs rather than standardized formulations, leading to inconsistencies in results. Additionally, patient populations in existing studies vary widely, making it difficult to generalize findings [27]. Another significant challenge is the variability in herbal preparation. Differences in plant species, extraction methods, and dosages can impact the efficacy and safety of herbal treatments [28]. Standardizing these

Future Directions

Future research should focus on several key areas to establish the clinical potential of herbal therapies for hyperprolactinemia: Conducting well-designed randomized controlled trials (RCTs) to confirm the efficacy and safety of herbal treatments. Most existing studies are preclinical or small-scale, necessitating large-scale human trials to validate findings [30]. Investigating the synergistic effects of herbal combinations. Traditional medicine often employs polyherbal formulations, which may enhance therapeutic outcomes through complementary mechanisms. Research should explore optimal combinations and dosages for maximal prolactin

prolactin secretion through estrogen receptor interactions. Peony root, when combined with licorice, has been found to regulate ovarian function and restore hormonal balance [25].

factors is essential for reliable clinical applications. Furthermore, while herbal therapies generally have favorable safety profiles, potential drug-herb interactions and long-term effects remain underexplored [29]. Future research should focus on well-designed clinical trials to validate the efficacy and safety of herbal treatments for hyperprolactinemia. Mechanistic studies exploring pharmacokinetics and bioavailability will also be crucial for optimizing herbal interventions as alternative or adjunctive therapies to conventional dopamine agonists.

CONCLUSION

Herbal therapies offer a promising avenue for the management of hyperprolactinemia, particularly for individuals seeking alternative or adjunctive treatments. Their potential benefits include prolactin-lowering effects, improved hormonal balance, and reduced side effects compared to conventional pharmacological treatments. However, despite encouraging preliminary evidence, further clinical validation is essential to establish their role in

regulation. Elucidating precise molecular mechanisms of action. While some herbs are known to exert dopaminergic, antioxidative, and hormonal-modulating effects, further studies are needed to clarify their interactions with prolactin pathways at the cellular and molecular levels. Assessing long-term safety and potential drug interactions. Given the increasing use of herbal medicine alongside conventional treatments, it is essential to evaluate possible interactions with dopamine agonists and other endocrine-related medications. Standardizing herbal extracts and ensuring quality control will also be critical for clinical application.

mainstream medical practice. Future research should aim to bridge the gap between traditional herbal use and evidence-based medicine by conducting rigorous studies that confirm their efficacy, safety, and mechanisms of action. Standardization, quality control, and regulatory guidelines will also play a crucial role in ensuring the safe and effective integration of herbal therapies into clinical practice.

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CITE AS: Chelimo Faith Rebecca (2025). Herbal Therapies for Hyperprolactinemia: Current Evidence and Future Directions. IDOSR JOURNAL OF BIOLOGY, CHEMISTRY AND PHARMACY 10(1):48-52. <https://doi.org/10.59298/IDOSR/JBCP/25/101.485200>