World Journal of Pharmaceutical Science and Research
www.wjpsronline.com
Review Article
ISSN: 2583-6579
SJIF Impact Factor: 3.454
Year - 2023
Volume: 2; Issue: 6
Page: 308-314

HERBAL TREATMENT FOR MALE HYPOGONADISM

Pranita Sunar*[1] and Sabitri Pradhan[2]

[1]Department of Pharmacognosy, Mata Gujri College of Pharmacy, Kishanganj, Bihar, India.
[2]Department of Pharmacology, Mata Gujri College of Pharmacy, Kishanganj, Bihar, India.

Article Received: 28 October 2023 | | ***Article Revised: 18 November 2023*** | | ***Article Accepted: 08 December 2023***

Corresponding Author: Pranita Sunar
Department of Pharmacognosy, Mata Gujri College of Pharmacy, Kishanganj, Bihar, India.
DOI: https://doi.org/10.5281/zenodo.10457970

ABSTRACT

Male Hypogonadism is a disorder that occurs when the body is unable to produce adequate levels of testosterone hormone. Testosterone is a primary androgenic hormone which is responsible for the appropriate development and expansion of male sexual organs along with the maintenance of secondary sex characteristics. The testosterone levels in men starts dropping down around the age 25 and continue to decline substantially with age. Annually, the testosterone levels may fall by 2%. After puberty, hypogonadism typically causes complaints such as lowered libido, erectile dysfunction, infertility, gynecomastia, poor masculinization, changes in body composition, affects body and facial hair and osteoporosis. Low testosterone levels can cause a variety of issues with an individual's psychological and physical well-being. The purpose of the present study was to bring a quick overview of commonly used medicinal plants that can effectively enhance testosterone levels in males.

KEYWORDS: Male hypogonadism, Testosterone, Herbs, Treatment.

INTRODUCTION

Male hypogonadism, also known as “Androgen deficiency” marked by low testosterone level in males corresponds to an elevated risk of morbidity and mortality. The principal treatment for Hypogonadism (HD) is Testosterone Replacement Therapy (TRT), that might worsen previously existing medical issues. Alternative approaches, including natural herbs and extracts, has been investigated for the potential interventions of hypogonadism.[1] Using plant-based items to boost an individual's overall wellness has been carried out for thousands of years. Crude herbs as well as herbal supplementation have been studied for their usefulness in a variety of applications including hypertension, diabetes, pregnancy obesity, depression, and endurance and fitness and many other diseases. A broad range of herbs have been reported to boost the levels of hormones in the body. Considering an overview of testosterone, the current study focuses on the impact of botanicals on testosterone concentrations.[2]

HERBS USED TO TREAT HYPOGONADISM

Conventional herbs for the treatment of male hypogonadism

Based on a review of the literature, it was apparently revealed that the various parts of herbs such as fruits, leaves, seeds, roots, and the entire plant were employed for both in vitro and in vivo investigations for the avoidance and management of male hypogonadism.

1. Ashwagandha

Scientific Name: ***Withania somnifera***

Family: Solanaceae

Ashwagandha is an herb which is extensively used in Ayurvedic medicine to restore freshness, stamina, strengthen the muscle and improve general well-being (Fig. 1). The root of the ashwagandha (*Withania somnifera*) herb is used as a crude medication because it contains active phytoconstituents, specifically Withanolide glycoside. Several animal studies have shown that ashwagandha can affect the hypothalamic-pituitary-gonadal hormonal balance and boost testosterone level.[3] A test was conducted on 50 volunteers to investigate whether ashwagandha root extract is effective in enhancing male sexual health. The study showed that approximately 99.9% of the volunteers had a higher likelihood of experiencing an improvement in sexual function after administering the root extract. Regardless of group or time, the overall testosterone levels found in the study were all within the normal range.[4]

Figure 1: Ashwagandha.

2. Ginger

Scientific Name: ***Zingiber officinale***

Family: Zingiberaceae

The herb ginger, officially known as *Zingiber officinale*, is a perennial plant whose rhizomes (Fig. 2) have long been used as a cure for a number of medical maladies, including indigestion, gastric upset, hair fall, cough and throat issues.[5] In addition to these, ginger has a long history of usage in folk medicine as a sexual stimulant. The anti-oxidants in ginger rhizomes can reduce oxidative stress in sperm, enhancing the quality of semen, and strengthen the sperm fertility. Gingerol, gingerdione, and gingerdiol are some of the phytoconstituents of ginger that are responsible for these benefits. Some research has supported the use of ginger in reducing DNA damage as well as the enhancing effect of ginger on serum testosterone levels and serum glutathione levels. This review study advised the consumption of ginger particularly in the case of people or animals with limited fertility.[6]

Figure 2: Ginger.

3. Kaunch beej

Scientific Name: ***Mucuna pruriens***

Family: Fabaceae

Mucuna pruriens aka Kaunch beej is also known as "Velvet bean" in some parts of the world as shown in Figure 3. Being one of the traditional herbs of India and some parts of China, this plant was mainly cultivated as crop. The seeds provide the plenty of nutritional protein. It is also found to contain numerous secondary metabolites such as phenolic compounds, tannins (gallic acid), flavonoids, alkaloids (mucunine, prurieninine) etc. These bioactive compounds of kaunch beej aids in management of various human ailments such as atherosclerosis, diabetes mellitus, parkinsonism, rheumatoid arthritis.[7] The ethanolic and methanolic extract of the seed supports stamina, improves reproductive system performance, and serves as an aphrodisiac by significantly raising the serum testosterone level in male.[8,9]

Figure 3: Velvet bean.

4. Horny Goat Weed

Scientific Name: ***Epimedium*** **Spp.**

Family: Berberidaceae

Epimedium plant is one of the key herbs (Figure 4) used in Traditional Chinese Medicine which is believed to works effectively in erectile dysfunction and osteoporosis. It is commonly known as barrenwort in English and "yin yang huo" in Chinese culture. Some Chinese researchers has identified Icariin, a steroidal glycoside as an active constituent of this plant. Smaller dose of Icariin resulted in higher serum testosterone levels, and vice versa, according to a study that has assessed the drug's impact on sham animals.[10] Various studies have confirmed that intake of high dose of horny goat weed is directly related to chronic conditions such as irregular heartbeat, hypotension spasm and respiratory failure.[11]

Figure 4: Horny Goat Weed.

5. Puncture vine

Scientific Name: ***Tribulus terrestris***

Family: Zygophyllaceae

Puncture vine is a small leafy plant, commonly called as "Gokhuru" in Indian community, a well-known traditional herb (Figure 5). It is grown in location with dry climate, where other plants hardly survive. Various research has suggested that this plant may offer potential health benefits such as reducing blood sugar level, treatment of renal calculi, boosting libido and reducing inflammation.[12] It is regarded as a classic stimulant of male sexual impulses and

a potent diuretic. *Tribulus terrestris* has been found to contain a wide range of phytochemicals, including steroidal saponins, phenolic compounds, tannins, amino acids, proteins, and phytosterols.[13] The bioactive component has been identified as a steroidal saponin, more precisely protodioscin. The dry extract of *Tribulus terrestris* has been shown in an experiment by Natasha FP et al. to potentially treat the male reproductive damage produced on by cyclophosphamide. Cyclophosphamide is an anticancer medication which has a negative impact on male fertility when taken during cancer therapy. This study discovered a promising effect of puncture vine aka *Tribulus terrestris*, in preserving the quality of sperm and serum testosterone levels in cancer patients under cyclophosphamide treatment.[14]

Figure 5: Puncture Vine.

6. Safed Musli

Scientific Name: ***Chlorophytum borivilianum***

Family: Asparagaceae

It is one of the India's rare plants (Figure 6) and its tubers are frequently used in Indian medical system including Ayurveda, Homeopathy and Unani to cure various illnesses like obesity, erectile dysfunction, inflammation, etc. In certain regions of Indian states, it is grown and consumed as a vegetable. Regular intake of safed musli in boiled milk has advantages for those who experience impotence and early ejaculation. The plant is endowed with a variety of chemical components, including triterpenoidal and steroidal saponins, fructans, alkaloids, sapogenin, phenolics, and vital elements like calcium, magnesium, and potassium, making it a rich source of therapeutic agent.[15] In accordance with Sudipta Kumar Rath et al., a 500 mg capsule containing a water extract of safed musli was investigated on volunteers ranging in age from 20 to 40 years old. And it was discovered that the water extracts significantly increased the quantity and quality of semen in volunteers between the ages of 20 and 40 while showing no signs of an adverse drug reaction, thereby restoring the use of safed musli.[16]

Figure 6: Safed Musli.

7. Country mallow

Scientific Name: ***Sida cordifolia***

Family: Malvaceae

Country mallow, commonly known as Bala in India is a perennial shrub with dark yellow coloured flower (Figure 7) and it is native to India. The plant is traditionally utilized by people of different communities around the globe to treat various diseases. In Brazil, this plant was used to treat the conditions like inflammation of oral mucosa, bronchitis,

nasal congestion etc. In Africa, the plant was used for the treatment of respiratory disorders.[17] It has been used as an astringent, diuretic, and tonic in the Ayurvedic medical system to treat disorders like asthma, skin conditions, heart conditions, musculoskeletal discomfort, urinary infections, lack of libido and unintended weight loss.[18] The roots, seeds and leaves of the plant were found to possess the chemical constituents viz. ephedrine, pseudoephedrine, vasicinol, vasicinone, β-sitosterol, stigmasterol, N-methyl Tryptophan and flavanones. Gupta M. et al., established the spermatogenesis action of extract of *Sida cordifolia* and *Glycyrrhiza glabra* extract in combination on male human volunteer having less sexual desire by using qualitative and quantitative investigations such as hormonal and semen analysis. The investigation found the considerable increase in sperm count after ingesting the extract of combined herbs.[19]

Figure 7: Country mallow.

8. Yohimbe Bark

Scientific Name: ***Pausinystalia johimbe***

Family: Rubiaceae

Yohimbe is an evergreen tree classified under the Rubiaceae family. The bark has traditionally been used to cure sexual imperfections and boost libido in males. For a very long time, Nigerian traditional healers touted the aphrodisiac properties of the yohimbe root. Yohimbine was found to be a principal Indole alkaloid present in root of *P. yohimbe.* In an in-vitro examination, methanol extracts of yohimbe roots successfully improved sexual behaviour in male rats by raising blood testosterone levels.[20]

Figure 7: Yohimbe Bark.

DISCUSSION

Chemical constituents

The outcomes of this review have provided insight into the possible secondary metabolite present in the above-mentioned plants that probably are responsible for treating the androgen deficiency. Ashwagandha possesses a glycosidic compound known as withanolide as a chief phytoconstituent. Gingerol, gingerdione, and gingerdiol are found in ginger rhizomes. The beans of *Mucuna pruriens* found to possess phenolic compounds, tannins (gallic acid), flavonoids, alkaloids (mucunine, prurieninine). Chinese researchers have investigated Icariin as the major chemical compound of *Epimedium* Spp. Puncture vine is a source of wide range of phytochemicals as it contains steroidal saponins, phenolic compounds, tannins, amino acids, proteins, alkaloids and phytosterols. Likewise, the tubers of safed musli is enriched with the secondary metabolites (triterpenoid and steroidal saponins, fructans, alkaloids, sapogenin, phenolics) and the essential elements (calcium, magnesium, and potassium). The entire part of country mallow

possesses various alkaloidal, steroidal and flavonoid compounds. Yohimbe bark is enriched in a pharmacologically active phytochemical “Yohimbine” which is an indole alkaloid.

The crude drugs studied under this literature review was found to contain the biologically active phytochemicals that helps in stimulating the testosterone hormone. Hence, it makes sense that a solution to treat testosterone insufficiency could be made from these plants in near future.

CONCLUSION

Allopathic medicine is seen to be expensive, harmful, and it is also known to have side effects. The usage of herbals (a gift from nature) dates back to a time when modernization in western medicine had not yet made its way into human life. The result of this study suggests a clear indication that the systemic use of herbs reviewed in this article has marked enhancement in serum testosterone level as well as sperm count. Therefore, it can be concluded that the natural ingredients of Aswagandha, Ginger, Kaunch beej, Horny goat weed, Puncture vine, Safed musli, Country mallow and Yohimbe bark possesses aphrodisiac property and can be used to combat hypogonadism in male.

REFERENCES

1. Smith SJ, Lopresti AL, Shaun YM and Fairchild TJ, Examining the Effects of Herbs on Testosterone Concentrations in Men: A Systematic Review. Advances in Nutrition, 2021; 12: 744-765.
2. Gunnels TA and Bloomer RJ, Increasing Circulating Testosterone: Impact of Herbal Dietary Supplements. Journal of Plant Biochemistry & Physiology, 2014; 2: 1-9.
3. Lopresti AL, Drummond PD, and Smith SJ, A Randomized, Double-Blind, Placebo-Controlled, Crossover Study Examining the Hormonal and Vitality Effects of Ashwagandha (*Withania somnifera*) in Aging, Overweight Males. American Journal of Men’s Health, 2019; 1-15.
4. Chauhan S, Srivastava MK and Pathak AK, Effect of standardized root extract of ashwagandha (*Withania somnifera*) on well-being and sexual performance in adult males: A randomized controlled trial. Wiley Health Science Report, 2022; 1-10.
5. L Khodaie, S Omid, Ginger from Ancient Times to the New Outlook. Jundishapur Journal of Natural Pharmaceutical Product, 2015; 1: e18402.
6. Ahangaran MG, Dehkordi MK, Javar AA, Salehi MH, Ostadpoor M, A systematic review on the effect of Ginger (*Zingiber officinale*) on improvement of biological and fertility indices of sperm in laboratory animals, poultry and humans. Veterinary Medicine and Science, 2021; 7: 1959–1969.
7. Dora BB, Kumar S, Kapikacchu (*Mucuna pruriens*): A promising indigenous herbal drug and its effect on different disease conditions. Research & Reviews: A Journal of Toxicology, 2017; 3: 1-5.
8. Muthu K, Krishnamoorthy P, Evaluation of androgenic activity of *Mucuna pruriens* in male rats. African Journal of Biotechnology, 2011; 10: 15017-15019.
9. Kumara S, Alia MY, Sailaja P, Mahesh S, Surekha MV, Giridharan NV, Harishankar N, male reproductive enhancing activity of *Mucuna pruriens* Linn. Seed extract in WNIN/GR-OB obese rats – an infertile obese mutant rat model with prediabetes. International Journal of Current Research, 2011; 6: 323-327.
10. Shindel A W, Zhong-Chen Xin, Thomas M. Fandel, Huang Y C, Breyer N. B, Garcia MM, Lin SC and Lue T F, Erectogenic and Neurotrophic Effects of Icariin, a Purified Extract of Horny Goat Weed (Epimedium spp.) In Vitro and In Vivo. The Journal of Sexual Medicine, 2010; 7: 1518-1528.

11. Felson S, Men's Health Guide. WebMed, November 10, 2022.
12. Raman R, Richter A, Orford S, 8 Emerging Benefits of Gokshura. Nutrition, 2021.
13. Akram M, Asif HM, Akhtar N et al., *Tribulus terrestris* Linn.: A review article. Journal of Medicinal Plants Research, 2011; 5: 3601-3605.
14. Pavin NF, Izaguirry AP, Soares MB, Spiazzi CC etal., *Tribulus terrestris* Protects against Male Reproductive Damage Induced by Cyclophosphamide in Mice. Oxidative Medicine and Cellular Longevity, 2018; 1-9.
15. Bansal N, Safed Musli *Chlorophytum borivilianum*. MOJ Bioequivalence and Bioavailability, 2018; 5: 327-330.
16. Rath SK, Panja AK, Clinical Evaluation of Root Tubers of Shweta Musali (*Chlorophytum borivilianum* L.) and its effect on Semen and testosterone. An International Quarterly Journal of Research in Ayurveda, 2013; 34: 273-275.
17. Franco CIF, Morais LC, Quintans LJ, Almeida RN, Antoniolli AR, CNS Pharmacological Effects of the Hydroalcoholic Extract of *Sida cordifolia* L. Leaves. Journal of Ethnopharmacology, 2005; 98: 275-279.
18. Chatterjee A, Prakashi SC, The Treatise on Indian Medicinal Plants, Publications and Information Directorate, CSIR, New Delhi, 1992.
19. Gupta M, Mondal AK, Clinical Evaluation of a Novel Ayurvedic Formulation for Treatment of Male Sexual Disorders. International Journal of Research in Medical Sciences, 2020; 7: 2515-2523.
20. Ojatula AO. Mac Donald I, Timothy O, Aphrodisiac Potentials of *Pausinystalia yohimbe* (K. Schum.) Pierre ex Beille Methanol Root Extract in Male Wister Rats. Journal of Integrative Nephrology and Andrology, 2020; 7: 47-55.