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Nature's stress buster: The miraculous benefits of ashwagandha

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Abstract
Background: Ashwagandha (*Withania somnifera*), a traditional Ayurvedic adaptogen, has been extensively used for managing stress and anxiety. This study aimed to evaluate the efficacy of ashwagandha supplementation in reducing perceived stress, anxiety, and cortisol levels in adults.
Methods: A 12-week, double-blind, placebo-controlled, randomized clinical trial was conducted with 120 participants. The intervention group received 300 mg of ashwagandha root extract daily, while the placebo group received an inert substance. Outcomes were assessed using the Perceived Stress Scale (PSS), Hamilton Anxiety Rating Scale (HAM-A), and serum cortisol levels.
Results: The ashwagandha group showed significant improvements compared to the placebo. PSS scores reduced by 45.3% ($p<0.01$), HAM-A scores by 40.2% ($p<0.01$), and cortisol levels by 33% ($p<0.01$). The placebo group exhibited minor reductions in all parameters, which were not clinically significant. These findings align with prior studies, confirming ashwagandha's adaptogenic and anxiolytic properties.
Conclusion: Ashwagandha supplementation significantly reduces stress, anxiety, and cortisol levels, supporting its use as a natural therapeutic option for stress management. Further research is needed to confirm its long-term safety and efficacy in specific populations.

Keywords: Ashwagandha, *Withania somnifera*, stress management, anxiety reduction, adaptogen, cortisol, perceived stress scale, hamilton anxiety rating scale, natural supplements, ayurveda

Introduction

In recent years, there has been an increasing interest in the potential health benefits of herbal supplements, especially in the context of stress management and mental health. One such herb that has gained substantial attention is *Withania somnifera*, commonly known as ashwagandha. Often referred to as "nature's stress buster," ashwagandha has been used in traditional Ayurvedic medicine for centuries to enhance physical endurance, promote mental clarity, and improve overall vitality. Recent scientific research has begun to validate some of these age-old claims, particularly in relation to its effects on stress reduction, anxiety, and cognitive enhancement.

Ashwagandha is classified as an adaptogen, which refers to substances that help the body resist stressors of various kinds, whether physical, chemical, or biological. The primary active components in ashwagandha, called withanolides, are believed to exert neuroprotective, anti-inflammatory, and antioxidative effects, which may contribute to its ability to reduce stress and improve mental health. Studies have demonstrated that ashwagandha supplementation can significantly lower cortisol levels, a hormone released in response to stress, which, when elevated chronically, can lead to negative health outcomes such as hypertension, immune suppression, and weight gain.

Clinical trials have shown promising results, with participants experiencing a reduction in stress and anxiety after ashwagandha supplementation. A study by Chandrasekhar *et al.* (2012) [1] found that individuals who took ashwagandha extracts exhibited a substantial reduction in cortisol levels and anxiety scores compared to a placebo group. Similarly, another study by Ziegenfuss *et al.* (2018) [2] highlighted the herb's potential in improving mental clarity and reducing the cognitive effects of stress.

The scientific interest in ashwagandha has led to its integration into modern wellness practices, with people seeking natural remedies for anxiety, depression, and general well-being. However, despite its widespread use, it is important to recognize the variability in quality and concentration among commercial ashwagandha supplements. As with any natural remedy, proper dosage and sourcing are essential to achieving optimal results and avoiding potential adverse effects.

This article aims to explore the various health benefits of ashwagandha, particularly its role in stress management, while examining the latest clinical evidence supporting its efficacy. Additionally, we will discuss the mechanisms through which ashwagandha exerts its therapeutic effects and consider its place in both traditional and contemporary healthcare practices.

Materials

For this study, the primary material used was standardized ashwagandha root extract (*Withania somnifera*), which was sourced from a reputable supplier. The extract was selected for its high concentration of withanolides, the active compounds believed to confer the therapeutic effects of ashwagandha. The extract was provided in capsule form, with each capsule containing 300 mg of ashwagandha root extract. The authenticity and quality of the ashwagandha extract were confirmed through batch testing, ensuring that the withanolide content met the specifications outlined by the manufacturer. Additionally, a placebo group was used, receiving identical capsules containing an inert substance,

ensuring the blinding of both participants and researchers. The study was approved by the ethical review board of the institution, and informed consent was obtained from all participants.

Methods

A double-blind, placebo-controlled, randomized clinical trial design was employed to assess the effects of ashwagandha on stress reduction and anxiety. Participants were recruited based on their self-reported stress and anxiety levels and were randomly assigned to either the ashwagandha group or the placebo group. The intervention lasted for 12 weeks, with participants instructed to take one capsule of ashwagandha or placebo daily. Stress levels were measured using the Perceived Stress Scale (PSS), and anxiety levels were assessed using the Hamilton Anxiety Rating Scale (HAM-A) at baseline, week 6, and week 12. Blood samples were collected at these time points to measure cortisol levels, with the cortisol assay conducted using a high-sensitivity enzyme-linked immunosorbent assay (ELISA). Statistical analysis was performed using SPSS software, employing a two-way analysis of variance (ANOVA) to compare the effects between the two groups, and a significance level of $p<0.05$ was considered.

Results

The clinical trial involved 120 participants, with 60 in the ashwagandha group and 60 in the placebo group. The baseline characteristics, including age, gender, and initial stress and anxiety levels, were similar between the two groups. The participants ranged from 18 to 55 years of age, with a mean age of 32.5 ± 7.8 years.

At the conclusion of the study, significant improvements were observed in the ashwagandha group compared to the placebo group. In terms of perceived stress, as measured by the Perceived Stress Scale (PSS), the ashwagandha group exhibited a significant reduction in scores from baseline (mean PSS score 22.5 ± 5.3) to week 12 (mean PSS score 12.3 ± 4.1), with a mean reduction of 10.2 points ($p<0.01$). In contrast, the placebo group showed a slight reduction in PSS scores, from 22.7 ± 5.5 at baseline to 20.5 ± 5.6 at week 12, with a mean reduction of only 2.2 points ($p<0.05$).

Anxiety levels, as assessed by the Hamilton Anxiety Rating Scale (HAM-A), also showed significant improvement in the ashwagandha group. The mean HAM-A score decreased from 24.4 ± 4.7 at baseline to 14.6 ± 4.2 at week 12, indicating a reduction of 9.8 points ($p<0.01$). In the placebo group, the mean HAM-A score reduced from 24.6 ± 5.1 to 22.3 ± 4.9, a non-significant reduction of 2.3 points ($p=0.12$).

Cortisol levels, measured through blood samples at baseline and week 12, further supported the efficacy of ashwagandha supplementation. In the ashwagandha group, cortisol levels decreased significantly, from a baseline mean of 18.4 ± 3.2 µg/dL to 12.3 ± 2.5 µg/dL at week 12 ($p<0.01$), reflecting a 33% reduction. On the other hand, the placebo group exhibited a smaller reduction in cortisol levels, from 18.5 ± 3.3 µg/dL to 17.2 ± 3.1 µg/dL ($p=0.07$), indicating only a 7% reduction.

Overall, these results demonstrate that ashwagandha supplementation significantly reduced perceived stress, anxiety, and cortisol levels compared to the placebo group, supporting its efficacy as a natural stress management aid.

Table 1

Parameter	Ashwagandha Group (n=60)	Placebo Group (n=60)	p-value
Perceived Stress Scale (PSS)			
Baseline (Mean ± SD)	22.5 ± 5.3	22.7 ± 5.5	
Week 12 (Mean ± SD)	12.3 ± 4.1	20.5 ± 5.6	<0.01
Change from Baseline (Mean ± SD)	-10.2 ± 3.8	-2.2 ± 3.0	<0.01
Hamilton Anxiety Rating Scale (HAM-A)			
Baseline (Mean ± SD)	24.4 ± 4.7	24.6 ± 5.1	
Week 12 (Mean ± SD)	14.6 ± 4.2	22.3 ± 4.9	<0.01
Change from Baseline (Mean ± SD)	-9.8 ± 4.5	-2.3 ± 3.8	<0.01
Cortisol Levels (µg/dL)			
Baseline (Mean ± SD)	18.4 ± 3.2	18.5 ± 3.3	
Week 12 (Mean ± SD)	12.3 ± 2.5	17.2 ± 3.1	<0.01
Change from Baseline (Mean ± SD)	-6.1 ± 2.3	-1.3 ± 2.0	<0.01

Note: p-value <0.05 indicates statistically significant differences between the ashwagandha and placebo groups.

Discussion

The findings of this study strongly support the efficacy of ashwagandha (*Withania somnifera*) as a natural adaptogen with significant benefits in managing stress and anxiety. Participants in the ashwagandha group exhibited notable improvements in all measured parameters, including perceived stress, anxiety levels, and cortisol concentrations, compared to the placebo group. The reduction in Perceived Stress Scale (PSS) scores by 45.3%, Hamilton Anxiety Rating Scale (HAM-A) scores by 40.2%, and cortisol levels by 33% over 12 weeks demonstrates the herb's potential as a safe and effective intervention for stress management.

These findings align closely with previous research. Chandrasekhar *et al*. (2012) [1] conducted a similar study in which participants receiving 300 mg of ashwagandha extract twice daily showed a significant reduction in stress scores and serum cortisol levels compared to the placebo group. The reduction in cortisol levels observed in their study (30%) is consistent with the present study's findings, reinforcing ashwagandha's role in mitigating the physiological effects of chronic stress [1].

Additionally, Ziegenfuss *et al*. (2018) [2] demonstrated improvements in mental clarity and reductions in stress-related cognitive deficits with ashwagandha supplementation. In their study, a daily dose of 600 mg of ashwagandha root extract led to enhanced cognitive and emotional well-being over eight weeks. This corroborates the present study's observation of improved HAM-A scores and reduced perceived stress, suggesting that ashwagandha can support both psychological and cognitive resilience under stress [5].

Another study by Cooley *et al*. (2009) [6] examined the effects of adaptogens, including ashwagandha, in a mixed herbal formula. While their focus was on the synergistic effects of adaptogens, ashwagandha emerged as a critical component contributing to reductions in stress markers and anxiety symptoms. The study's outcomes, though based on a combination of herbs, underline ashwagandha's established adaptogenic properties.

In contrast to some earlier studies that used higher doses or different formulations of ashwagandha, this study highlights the effectiveness of a moderate dose (300 mg/day) in achieving significant outcomes without adverse effects. This dosage may offer a practical and tolerable regimen for individuals seeking natural stress management solutions.

The consistency of results across studies reinforces the adaptogenic and anxiolytic effects of ashwagandha. However, variations in study designs, populations, and formulations call for further exploration of optimal dosing strategies and long-term safety. Future research could also investigate the efficacy of ashwagandha in specific populations, such as individuals with clinically diagnosed anxiety disorders, to expand its therapeutic applications.

Conclusion

This study provides robust evidence supporting the use of ashwagandha (*Withania somnifera*) as a natural adaptogen with significant benefits for stress and anxiety reduction. The 12-week intervention resulted in notable decreases in perceived stress (45.3%), anxiety (40.2%), and cortisol levels (33%) in the ashwagandha group compared to the placebo. These results are consistent with prior studies, highlighting ashwagandha's potential as a safe and effective therapeutic option for managing stress-related conditions. Given its tolerability and efficacy at a moderate dose of 300 mg/day, ashwagandha represents a promising addition to both traditional and modern approaches to stress management. Further research exploring its long-term safety and application in clinical populations is warranted.

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