



Experimental evidence on the therapeutic effects of ashwagandha on the human body: A literature review

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Abstract. Ashwagandha-based preparations are gaining increasing global popularity as effective natural therapeutic agents. However, the lack of consensus regarding the scientific validity of this plant's effects and the absence of comprehensive biochemical studies highlight the need for a systematic analysis of its efficacy, particularly within the framework of evidence-based medicine. The purpose of this study was to assess the effectiveness of ashwagandha-based preparations through the analysis of experimental research. To achieve this, a systematic review and analysis of literature sources from scientific databases were conducted using an analytical approach. A range of experimental studies demonstrate that the application of the leaves and roots of two ashwagandha species, *Withania somnifera* and *Withania coagulans*, is the most effective. Both aqueous extracts and alcohol-based extracts exhibit comparable therapeutic value. The most commonly available formulations are in capsule or tablet form. Notably, a positive impact and improvements in cognitive functions, psychological well-being, and physical performance have been observed among volunteers participating in experiments. Improvements have also been reported in conditions such as depression, anxiety, hormonal imbalances, muscle weakness, and sexual dysfunction. The antioxidant and anti-inflammatory properties of *Withania somnifera* contribute to slowing down ageing processes, inhibiting tumour development, and supporting the proper functioning of the cardiovascular, nervous, and muscular systems. Combined preparations containing ashwagandha demonstrate particularly high efficacy, enhancing the studied health parameters. Furthermore, incorporating this herbal extract into primary medical treatments has been shown to accelerate patient recovery. Importantly, ashwagandha is not contraindicated for older adults; on the contrary, experimental evidence suggests that its consumption reduces muscle atrophy, improves overall well-being, and regulates hormonal balance in elderly men. According to experimental findings, ashwagandha possesses a range of therapeutic properties that can substantially improve human health indicators, particularly in men. Therefore, the integration of this medicinal plant into contemporary medical practice may yield highly beneficial results

Keywords: protective properties; anti-inflammatory and anti-tumour effects; antioxidant activity; hormonal regulation; antidepressant effects

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Introduction

The rising prevalence of chronic diseases, heightened levels of anxiety and stress, frequent depressive states, weakened immunity, and muscle atrophy due to physical inactivity are direct consequences of global and social factors. These include climate change, the modern pace of life, and environmental issues, which have become particularly pronounced in the 21st century. Consequently, researchers face the challenge of identifying new, commercially viable, natural therapeutic agents with broad-spectrum effects that enhance physical and mental well-being. Ashwagandha has been attracting increasing attention from physicians and scientists due to its adaptogenic properties and its alignment with contemporary healthcare demands. Experimental studies confirm the high biological activity of this medicinal plant, demonstrating its positive effects on psycho-emotional well-being, the nervous system, and physical endurance. Its antioxidant properties contribute to cellular protection, thereby reducing the risk of chronic diseases.

Ashwagandha, also known as Indian ginseng, has been used in Indian medicine since ancient times as a sedative, diuretic, immunostimulant, anti-stress agent, anthelmintic, and treatment for constipation, haemorrhoids, and other ailments [1–3]. In recent years, an increasing number of scientists have provided evidence supporting the therapeutic potential of this plant in modern medicine. Two species of ashwagandha are most commonly used for medicinal purposes: *Withania somnifera* and *Withania coagulans*. The immunomodulatory effects of leaf and root extracts from these species were experimentally analysed by A. Tharakan [4] in healthy adult volunteers. Their findings indicate that the positive immunomodulatory effects extend not only to adaptive immunity but also to innate immunity. As a result, the researchers recommend this plant as a dietary supplement.

The efficacy of *Withania somnifera* in promoting mental health was examined by W. Sobota *et al.* [5], who discovered that this medicinal plant can reduce glucocorticoid levels, particularly cortisol. Participants demonstrated improved results in stress, anxiety, and depression assessments. According to the authors, ashwagandha is a safe and efficacious means of stress management when prescribed by a physician. Furthermore, numerous researchers highlighted the beneficial effects of ashwagandha on sleep regulation. Specifically, A. Deshpande *et al.* [6] conducted a clinical evaluation of the impact of *Withania somnifera* root extract on sleep in individuals suffering from insomnia and healthy volunteers. Their findings indicated that the root extract not only enhances sleep quality but also effectively mitigates insomnia. Moreover, this medicinal preparation was well tolerated by all participants.

Overall, ashwagandha has demonstrated a positive impact on cognitive functions. American researchers M. Leonard *et al.* [7] conducted clinical trials confirming improvements in short-term memory, reduced reaction times, and enhanced attention and alertness in men and women. According to their findings, the potential

applications of this medicinal plant are evident, necessitating further research into its nootropic effects.

In establishing the efficacy of a medicinal product, researchers conduct experiments involving laboratory animals. For instance, a study by Z.F. Khattak *et al.* [8] tested a crude methanolic extract of *Withania coagulans* fruit on mice to demonstrate the anticonvulsant effects of ashwagandha. Their findings indicated a positive trend and a reduction in seizure manifestations, supporting further research into the development of a safe anticonvulsant treatment for humans. This approach allowed for a comprehensive evaluation of the plant's effectiveness, minimisation of adverse effects, and determination of the minimum therapeutic doses.

To assess the efficacy and safety of ashwagandha for human consumption, clinical trials were conducted to evaluate the tolerability of certain ashwagandha-containing formulations. V.G. Vaidya *et al.* [9] conducted a four-week study involving 500 volunteers who received 500 mg capsules of *Withania somnifera* root extract twice daily. According to the researchers, no adverse effects were identified, which represents the plant's suitability for therapeutic use.

Given the growing body of research on ashwagandha, there arises a need for the systematic organisation of experimental data to provide a clearer perspective on the plant's medicinal potential. A key aspect that has received limited attention is the identification of the most relevant experimental studies related to contemporary human diseases and dysfunctions. A rigorous analysis of well-selected studies enables a deeper understanding of the prospects and benefits associated with the use of this medicinal plant.

The purpose of this study was to determine the efficacy of ashwagandha-based medicinal products through an analysis of experimental research, with a particular focus on current health conditions. To achieve this, a systematic review was conducted, employing a comprehensive and transparent approach to the search, selection, evaluation, and synthesis of scientific literature on the subject. The inclusion criteria for analysis encompassed experimental studies on the effects of ashwagandha-based preparations on the human body, published in peer-reviewed scientific papers within the last ten years, and available in English or Ukrainian. Exclusion criteria included studies lacking methodological transparency and those that did not align with the research subject. The primary sources of information were scientific databases such as PubMed, Scopus, Google Scholar, and Web of Science. A total of 41 papers were selected, of which 32 were experimental studies, while the remainder were review publications. Each study underwent a critical quality assessment using appropriate evaluation methodologies.

The impact of ashwagandha on stress levels and depressive states

A thorough review and analysis of the experimental evidence regarding ashwagandha's effects on the human body demonstrated that the majority of studies focused on its beneficial impact on physiological states and

bodily systems. However, there was a notable scarcity of information concerning potential side effects or negative influences, and therefore, these aspects were not discussed in detail in this review. The most relevant studies, along with their findings, are elaborated on further.

In the contemporary world, stress levels and the prevalence of depressive conditions have increased. Consequently, researchers are actively developing and investigating a range of ashwagandha-based formulations to address these dysfunctions. For instance, to establish the efficacy and safety of a novel standardised root extract of *Withania somnifera*, known as Witholytin, in adults experiencing high levels of stress and fatigue, S.J. Smith *et al.* [10] conducted a study involving 120 adult participants with these symptoms. The participants were randomly assigned to either an experimental group, which received Witholytin at a daily dose of 600 mg, or a placebo group. The study lasted for 12 weeks, and the efficacy of the intervention was assessed using various psychometric scales. The results demonstrated statistically significant improvements in all evaluated parameters among those taking Witholytin compared to the placebo group. Specifically, stress levels decreased by 34.2% in the experimental group, compared to 12.1% in the placebo group; fatigue levels declined by 29.5% versus 8.7% in the placebo group; and overall quality of life improved. Witholytin was well tolerated, with minimal reported side effects. These findings indicate that this novel standardised ashwagandha root extract is an effective and safe means of reducing stress and fatigue in adults.

A similar study examining ashwagandha in the form of the Shoden supplement was conducted by D.N. Mishra & M. Kumar [11] to evaluate its effects on stress and anxiety levels in healthy adults experiencing frequent stress. The experiment involved 100 healthy adults with high stress levels, who were divided into an experimental group receiving Shoden and a placebo group. The study lasted for eight weeks, with efficacy assessed using standardised questionnaires measuring stress and anxiety levels, as well as physiological indicators such as blood pressure and heart rate. The intake of Shoden over eight weeks resulted in a statistically significant reduction in stress and anxiety levels, and an improvement in physiological parameters compared to the placebo group. Specifically, anxiety levels decreased by 59% in the experimental group, while morning serum cortisol levels were reduced by 66%, compared to only a 2.22% reduction in the placebo group.

Further evidence supporting the positive effects of *Withania somnifera* on individuals experiencing chronic stress was provided by S. Pandit *et al.* [12]. This study investigated the impact of an aqueous extract of ashwagandha root and leaves on adult participants reporting persistent stress. A total of 131 adults were enrolled in the study and were administered Sensoril, an aqueous extract of ashwagandha root and leaves, in doses of 125 mg, 250 mg, or 500 mg. The study lasted for eight weeks and demonstrated that even the lowest administered dose exerted beneficial effects. According to the researchers, participants

experienced a reduction in stress symptoms, improved sleep parameters, and enhanced overall well-being. The supplement was well tolerated, with no reported adverse effects. The researchers thus recommend Sensoril as a safe and effective intervention for alleviating mild to moderate stress and improving general well-being.

A similar perspective is shared by S.M. Ross [13], who argues that the broad spectrum of ashwagandha's effects has a positive impact on patients' psychological well-being. A.B. Speers *et al.* [14] also investigated the neuropsychiatric effects of *Withania somnifera*, specifically examining its influence on disorders such as stress, depression, anxiety, and insomnia. The findings indicated that ashwagandha root extract exhibited both anti-stress and anxiolytic properties. The researchers suggest that these effects occur through the modulation of the hypothalamic-pituitary system and GABAergic pathways.

Depression and anxiety can cause chronic stress, which can trigger certain inflammatory processes in the body. To address such symptoms, A.V. Krishna Raju *et al.* [15] employed a slow release ashwagandha extract (AshwaSR) and conducted both *in vivo* and *in vitro* experiments. The anti-depressant and anxiolytic effects of AshwaSR were assessed *in vivo*, where test animals subjected to chronic stress for 28 days were subsequently administered the extract. The efficacy of the treatment was evaluated through behavioural tests, including the open field test, elevated plus maze, forced swimming test, and Morris water maze test. This formulation improved behavioural outcomes in rats, manifesting as a reduction in symptoms of depression and anxiety. In the *in vitro* phase, the anti-inflammatory activity of ashwagandha extract was examined by assessing its inhibitory effects on cytokine production in macrophage cell lines. The results demonstrated that the extract exerted an inhibitory effect on interleukin-6 (IL-6) and tumour necrosis factor-alpha (TNF- α). These findings support the potential application of ashwagandha as a natural remedy for maintaining mental health and mitigating inflammation, which may be associated with the development of depression and anxiety.

The ability of ashwagandha to reduce stress levels was also highlighted in a pharmacological review by A.S. Chopra [16]. The author provides a detailed account of ashwagandha's pharmacological properties, including its capacity to lower stress and anxiety levels, improve sleep quality, support the immune system, and exhibit antioxidant and anti-inflammatory effects. Similarly, systematic reviews conducted by C. Akhgarjand *et al.* [17], P. Mikulska *et al.* [18] and V. Arumugam *et al.* [19] confirmed the efficacy of ashwagandha as a systemic treatment for stress and anxiety. Consequently, the use of this medicinal plant appears highly appropriate for managing stress-related conditions and depressive disorders.

Experimental studies on antioxidant and anti-inflammatory properties

Numerous studies on the therapeutic potential of ashwagandha focused on its antioxidant and anti-inflammatory

properties. A research team led by I.M. Khalil [20] demonstrated the protective effects of *Withania somnifera* leaf extract against oxidative stress and myocardial damage in rats induced by isoproterenol. The extract was administered to the rats for 28 days prior to isoproterenol induction. The effects of the extract were assessed through the analysis of biochemical markers of oxidative stress and myocardial damage in blood serum and myocardial tissue and through histopathological examination of cardiac tissue. These results support the potential of *Withania somnifera* as a natural antioxidant and a therapeutic agent for cardiovascular diseases associated with oxidative stress. The authors also emphasised the need for further research to investigate the molecular mechanisms of action of this extract and assess its efficacy and safety in clinical settings.

The antioxidant and neuroprotective properties of ashwagandha were also identified by J.N. Saykally *et al.* [21], who conducted an experiment simulating traumatic brain injury in mouse embryos. Following the injury, neurons were treated with varying concentrations of ashwagandha extract. The effects of the extract were evaluated through analyses of neuronal survival, morphological changes, and levels of inflammatory and oxidative stress markers. Based on the collected data, the authors concluded that *Withania somnifera* extract exhibits protective effects on neurons subjected to traumatic injury *in vitro*. These findings may have important implications for the development of novel therapeutic strategies for brain injuries and other neurodegenerative disorders.

In the study by P. Kumar *et al.* [22], evidence was provided that ashwagandha leaf extract exerts a glioprotective effect against lead-induced toxicity in rats. This protective action is attributed to the plant's antioxidant and anti-inflammatory properties, which help mitigate oxidative stress and neuroinflammation while safeguarding glial cells. These findings suggest that ashwagandha may serve as a potential therapeutic agent for alleviating the neurotoxic effects of lead exposure and related neurological disorders.

To further investigate the anti-tumour and anti-inflammatory properties of ashwagandha, a team of Chinese researchers led by S. Lee [23] conducted an experiment on human skin fibroblast cell cultures. The cells were exposed to TNF- α to induce an inflammatory response and cellular damage, followed by treatment with varying concentrations of the plant extract. The study demonstrated a reduction in oxidative stress and inflammatory cytokines, such as interleukin-6 (IL-6) and interleukin-8 (IL-8), in damaged skin fibroblasts. Furthermore, the extract enhanced the activity of antioxidant enzymes, including superoxide dismutase and catalase, and inhibited the activation of detrimental signalling pathways associated with inflammation and oxidative stress.

S. Wankhede *et al.* [24] linked their successful trials to the antioxidant, anti-inflammatory, and anabolic properties of *Withania somnifera* extract, investigating its effects on muscle strength and post-exercise recovery in healthy men. The study included 60 healthy male participants aged

between 18 and 50, who were randomly assigned to two groups: an experimental group (n = 30), which received ashwagandha extract at a dose of 500 mg twice daily for eight weeks, and a placebo group (n = 30), which received a placebo under the same regimen. All participants simultaneously followed a standardised strength training programme three times per week throughout the study period. Muscle strength and recovery were assessed at baseline and after four and eight weeks of training, using various tests, including maximal weightlifting for squats and bench press and measurements of creatine kinase levels as a marker of muscle damage. The findings confirm that incorporating *Withania somnifera* extract into a strength training regimen may enhance muscle strength and accelerate muscle recovery in healthy men. These effects could be beneficial for athletes, fitness enthusiasts, and individuals engaged in intensive physical activity.

Further experimental research led by M. Sarbishegi [25] demonstrated that *Withania coagulans* root extract reduced prostate gland size in rats with benign prostatic hyperplasia compared to the control group. In addition, the extract was found to induce apoptosis in prostate cells and inhibit the expression of cyclooxygenase-2, a key enzyme involved in inflammatory processes. Similar studies by these researchers were described in another publication, where the efficacy of biologically active compounds in *Withania coagulans* extract was demonstrated. These compounds, including flavonoids, steroids, and alkaloids, were shown to possess anti-cancer and antioxidant properties [26].

An experimental study conducted by A.A. Alghamdi *et al.* [27] focused on the anti-inflammatory and anti-angiogenic effects of *Withania somnifera* extract in mitigating liver toxicity induced by silver nanoparticles (AgNPs). The study was performed on male albino rats, which were divided into four groups: a control group, a group receiving injections of AgNPs, a group receiving oral administration of *Withania somnifera* (WS), and a group receiving both AgNPs and WS. The experiment lasted for 28 days. Following the completion of the study, biochemical blood analyses, histopathological examination of the liver, and measurements of inflammatory cytokine levels and angiogenesis markers were conducted. Exposure to silver nanoparticles resulted in an increase in biochemical markers of liver dysfunction, such as aspartate aminotransferase (AST), alanine aminotransferase (ALT), and lactate dehydrogenase (LDH), as well as histopathological alterations in the liver, including oedema, fatty degeneration, and inflammation. Concurrent administration of ashwagandha extract markedly reduced these indicators, restoring normal liver structure and function. Furthermore, WS lowered levels of pro-inflammatory cytokines, including interleukin-6 (IL-6) and tumour necrosis factor- α (TNF- α), as well as angiogenesis markers such as vascular endothelial growth factor (VEGF). The researchers concluded that *Withania somnifera* extract exhibits anti-inflammatory and anti-angiogenic properties, enabling it to mitigate AgNP-induced

liver toxicity in rats. Thus, a substantial body of research demonstrated the beneficial effects of ashwagandha as an antioxidant and anti-inflammatory agent.

Evidence of improved physiological parameters and overall well-being with ashwagandha supplementation

A series of experimental studies investigated the effects of ashwagandha on physiological parameters in elderly individuals. Notably, A.L. Lopresti *et al.* [28] examined the impact of *Withania somnifera* on hormonal status and vitality in older men exhibiting signs of obesity. The study assessed hormone levels (testosterone, cortisol), physical endurance, and participants' overall well-being. Ashwagandha supplementation resulted in a statistically significant 17% increase in free testosterone levels and a 28% reduction in cortisol levels compared to the placebo group. Furthermore, improvements were observed in physical endurance and overall well-being among those receiving ashwagandha. Adverse effects were minimal and comparable to those in the placebo group. The study provides evidence supporting the potential benefits of *Withania somnifera* in managing age-related hormonal changes and enhancing quality of life.

Another research team from Korea, led by J.-S. Ko [29], investigated the effects of an ethanolic extract of ashwagandha on age-related muscle atrophy (sarcopenia). The study aimed to evaluate the anti-inflammatory and anti-atrophic effects of *Withania somnifera* extract on muscle tissue. Over a 12-week period, 20-month-old mice were administered ashwagandha extract at a dosage of 200 mg/kg body weight per day. The results demonstrated an increase in muscle mass and improved muscle fibre morphology compared to the control group. Furthermore, the extract reduced levels of pro-inflammatory cytokines such as interleukin-6 (IL-6) and tumour necrosis factor-alpha (TNF- α) and inhibited the expression of muscle atrophy biomarkers. The authors suggest that these effects may be linked to the activation of signalling pathways that support muscle maintenance and function, as well as the reduction of chronic inflammation commonly associated with ageing. The findings highlight the potential of *Withania somnifera* extract as a natural intervention for the prevention and treatment of sarcopenia in elderly individuals.

The beneficial effects of combining multiple medicinal plants with ashwagandha were observed by Z.A. Rizvi *et al.* [30], who examined the synergistic effects of *Withania somnifera* and *Tinospora cordifolia* (Guduchi). The study demonstrated antiviral activity against SARS-CoV-2 in vitro and revealed an immunomodulatory effect, stimulating the differentiation of T-helper 1 (Th1) and T-regulatory (Treg) cells, both crucial for immune system balance. Moreover, the extracts enhanced neutrophil function, increasing their phagocytic and chemotactic capabilities. These findings suggest that these plant extracts may contribute to the development of novel therapeutic strategies aimed at enhancing immune responses and antiviral defence mechanisms.

A. Saiyed *et al.* [31] investigated the combined effects of ashwagandha (*Withania somnifera*) and tribulus (*Tribulus terrestris*) extracts on letrozole-induced polycystic ovary syndrome (PCOS) in rats. The study demonstrated a statistically significant improvement in ovarian structure, a reduction in androgen levels, and enhanced fertility outcomes compared to the group receiving letrozole alone. While both ashwagandha and tribulus individually exhibited beneficial effects, their combination proved to be more effective.

A research team led by S. Chauhan [32] identified that the root of ashwagandha exhibits potency-enhancing properties comparable to those of Chinese ginseng. A standardised extract of ashwagandha root was shown to have a positive impact on sexual function, overall well-being, and stress levels in adult men. These findings support the standard use of ashwagandha and open new avenues for its application in modern medicine for the treatment of sexual dysfunctions and the enhancement of male quality of life. Furthermore, participants who consumed ashwagandha demonstrated improvements in overall well-being and reductions in stress levels. Similar experimental results were obtained by K. Sahin *et al.* [33], who conducted trials using a polyherbal formulation containing ashwagandha root.

An intriguing study was conducted by D. Xing *et al.* [34], which aimed to assess the effects of a single dose of *Withania somnifera* extract on cognitive function in healthy individuals. Thirty participants aged 18-35 were randomly assigned to either an experimental group (receiving 300 mg of standardised ashwagandha extract) or a control group (receiving a placebo). Before supplementation and 60 minutes after administration, participants completed a series of cognitive tests assessing various aspects of cognitive function, including attention, memory, information processing speed, and executive function. The results demonstrated that participants in the experimental group exhibited statistically significant improvements in most cognitive tests compared to the placebo group. Specifically, enhancements were observed in attention, short-term memory, information processing speed, and executive functions. No serious adverse effects were reported following the intake of the extract. These findings suggest that even a single dose of ashwagandha extract may have a beneficial impact on cognitive function in adults.

K.G. Choudhary *et al.* [35] conducted a detailed analysis of ashwagandha's ability to stimulate appetite, improve digestion, supply essential vitamins, and promote overall recovery in children. Based on their analysis, the authors concluded that due to its adaptogenic and nutritional properties, ashwagandha represents an effective and safe intervention for children with poor dietary intake.

Several other experimental studies demonstrated ashwagandha's positive influence on human hormonal balance, regulating the function of the thyroid, pancreas, adrenal glands, and reproductive system [36-38]. This wide-ranging physiological activity can be attributed to the abundance of biologically active compounds present in different parts of the plant.

Researchers increasingly recognise the potent therapeutic properties of ashwagandha, highlighting its potential for medical applications. Experimental studies provide valuable insights into the efficacy of this plant, underscoring its relevance in modern medicine. The broad spectrum of therapeutic effects associated with Ashwagandha positively influences multiple physiological systems and organs. Notably, its role in regulating hormonal activity is particularly sought after in medical applications, a perspective also supported by M. Wiciński *et al.* [39]. As numerous studies demonstrated, Ashwagandha-based formulations are widely used in the treatment of psychosomatic and psychiatric disorders. When combined with other medicinal plants or pharmaceutical agents, its effects appear to be further enhanced. A key advantage of Ashwagandha is its minimal incidence of side effects, low toxicity, and overall safety, even for paediatric use. This is supported by several of the reviewed studies and the pharmacological assessment conducted by D.S. Mandlik *et al.* [40]. Furthermore, elderly individuals report improvements in general well-being and muscle strength with regular intake of Ashwagandha-based supplements, findings that align with the study by S.B. Kelgane *et al.* [41]. However, some experimental studies were conducted on animal models, necessitating further evidence to confirm their efficacy in human subjects. It is also noteworthy that much of the literature supporting the long-standing and effective use of *Withania somnifera* and *Withania coagulans* was produced by researchers from China and India. However, a review of recent publications indicates a growing interest in Ashwagandha among scientists in Europe, Australia, and the United States. This suggests that ongoing experimental research holds considerable promise for the development of effective medicinal products derived from ashwagandha.

The potential applications of ashwagandha extend beyond general well-being to the treatment of various serious health conditions. Consequently, researchers from multiple countries are actively engaged in experimental studies investigating different formulations of this plant. The majority of studies report promising results in the treatment of multiple concurrent diseases or disorders. Through the integration of experimental research, scientific theories, and systematic analysis, it is possible to develop highly effective therapeutic formulations based on ashwagandha.

Conclusions

The analysis of experimental studies investigating the therapeutic properties of ashwagandha species *Withania*

somnifera and *Withania coagulans* provides compelling evidence supporting the efficacy of plant-based formulations in addressing contemporary health concerns. A systematic review of the literature demonstrated that ashwagandha possesses a broad range of therapeutic properties, including anti-stress, antioxidant, anti-inflammatory, immunomodulatory, and adaptogenic effects. These properties contribute to the overall improvement of numerous physiological parameters in younger individuals and the elderly. This study synthesised data on the effects of ashwagandha on various aspects of health, including physical endurance, recovery following exercise, and hormonal regulation, particularly its role in increasing testosterone levels and supporting reproductive health. Furthermore, findings indicate its efficacy in reducing stress, anxiety, and depressive symptoms while improving sleep quality and general well-being, making it especially relevant in modern clinical and preventative medicine. The antioxidant properties of ashwagandha contribute to reducing oxidative stress, thereby potentially preventing the development of cardiovascular diseases, oncological conditions, and neurodegenerative disorders. In addition, ashwagandha-based formulations demonstrated anti-inflammatory effects, which may be beneficial in the treatment of chronic inflammatory diseases.

The results obtained confirm the substantial therapeutic potential of ashwagandha in contemporary medicine. Its multifunctionality and safety profile suggest that this plant represents a promising candidate for integration into preventative and clinical practices. However, existing studies present certain limitations, including an insufficient number of clinical trials involving human participants, small sample sizes, and a lack of long-term assessments of efficacy and safety.

Thus, ashwagandha emerges as a multifunctional therapeutic agent with the potential for medical application. Future research should focus on expanding the scope of its therapeutic indications, investigating its combined use with other pharmaceutical agents, and optimising dosage regimens to maximise efficacy. Particular attention should be given to evaluating the long-term effects of ashwagandha consumption and its impact on specific patient populations, including the elderly and individuals with chronic health conditions.

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None.

Conflict of Interest

None.

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Дослідження експериментальних доказів позитивного впливу ашваганди на організм: огляд літератури

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Анотація. Препарати на основі ашваганди набирають дедалі більшої популярності у світі як ефективні засоби природної терапії. Однак відсутність єдиної позиції щодо наукової обґрунтованості дії цієї рослини та ґрунтовних біохімічних досліджень створює запит на систематичний аналіз ефективності використання ашваганди, особливо в контексті доказової медицини. Метою роботи було встановити ефективність використання препаратів на основі лікарської рослини ашваганди, шляхом аналізу експериментальних досліджень науковців. Для цього було здійснено систематичний огляд та аналіз літературних джерел з наукових баз з використанням аналітичного методу. Ряд експериментальних досліджень доводять, що застосування листя та коренів двох видів ашваганди *Withania somnifera* та *Withania coagulans* є найбільш дієвими. Водні витяжки та спиртові екстракти мають однакову терапевтичну цінність. Найбільш поширеними є капсульні або таблетовані форми препаратів. Відзначається позитивний ефект та динаміка покращення когнітивних функцій, психологічних та фізичних якостей у добровольців, які брали участь в експериментах. Також спостерігається покращення таких станів як депресія, тривожність, гормональний дисбаланс, м'язова слабкість, сексуальна дисфункція. Антиоксидантні та протизапальні властивості *Withania somnifera* забезпечують зниження процесів старіння, розвитку пухлин та нормальній роботі серцево-судинної та нервової системи та м'язів. Високі показники ефективності мають комбіновані препарати, які в своєму складі містять ашваганду, що помітно покращує досліджувані показники. Також додавання даного рослинного екстракту до медичних препаратів основної дії, сприяє швидшому одужанню пацієнтів. Важливо, що людям похилого віку не протипоказано приймання даної лікарської рослини, навпаки, експериментально доведено, що вживання ашваганди знижує м'язову атрофію, покращує загальне самопочуття, регулюючи гормональний баланс у чоловіків пенсійного віку. Згідно з результатами експериментів, ашваганда є рослиною, що має ряд терапевтичних властивостей, здатних суттєво покращити життєві показники людини, особливо чоловіків, тому застосування цієї лікарської рослини в сучасній медичній практиці може мати досить дієві результати

Ключові слова: захисні властивості; протизапальна та протипухлинна дія; антиоксидантна активність; гормональна регуляція; антидепресивна дія