

# Ashwagandha & Mental Health: Combatting Depression And Insomnia Naturally

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## Abstract:

Medical herbs have been transcribed in ancient texts for their therapeutic uses, Ashwagandha being one such medicinal drug has shown its importance in many neurological diseases and even as immune supplements. Ashwagandha's use as an antidepressant has significantly increased in the current time as it has proven to be a safer and efficacious drug due to its natural origin. Ashwagandha has its effect as anxiolytics and antidepressants due to Withanolides and Withaferin which are its main chemical constituents. Ashwagandha is a drug with many major therapeutic effects which are yet to be studied and is a very reliable solution for the increasing neurological and psychological disorders.

**Keywords:** Ashwagandha, *Withania somnifera*, Depression, Insomnia, Withanolides, Withaferin

## 1. Introduction:

The use of plants and herbs for treatment has been a practice in India since a long time. Books like the *Charaka Samhita* and the *Vedas* have records of over 7000 medicinal herbs which have been used for over many centuries<sup>[1]</sup>. Not only in India but also in other civilizations like the Arabic and the Chinese civilizations use of medicinal herbs has been recorded which gives proof of herbs and their therapeutic uses.

In India, use of the *Ayurveda*, *Siddha*, and *Unani* system of medicine from the centuries have been proven to be rather effective and is still being used in the rural areas and among the tribal population.

More than 80% of the medicines in these systems used currently are derived from plants sources<sup>[2]</sup>. These medicines are safer and affordable to use in comparison to the currently marketed pharmaceutical formulations and even though the rural people don't know about the scientific underlying of the drugs they use it on the basis of their experiences<sup>[3]</sup>.

Ashwagandha (AS) is one of the most reputed medicinal herbs in the Indian System of Medicine (ISM) for maintaining the humoral immunity of the body. It promotes tissue health and is also classified as an adaptogen because it promotes homeostasis and elicits complex responses<sup>[4]</sup>.

According to studies AS has functions in mood management, enhancing memory and focus, in addition to that has shown improvement in inflammation and oxidative stress which helps to cure various ailments including depression<sup>[5]</sup>.

Depression is a prevalent mental health disorder which has been prevalent in the recent days amongst the youth and in India over 25.7% of the population is affected by this disease<sup>[6]</sup>. The pathophysiology of this disease includes disrupted transmission of monoamine systems including lower levels of Dopamine, Norepinephrine and 5-HT<sup>[7]</sup>. Due to a common mechanism in many disease medications have been developed which fight depression i.e., Antidepressants<sup>[8]</sup>.

Many disorders including depression are caused by oxo-inflammatory conditions. Recently, there have been studies which focus on the role of inflammation on the body as one of the causes of depression or mood disorders<sup>[9]</sup>.

By researches, it has been established that oxidative stress is one of the major causes of depression and is also a major cause of neurodegeneration<sup>[8]</sup>. One potential treatment of depression can be the use of phytotherapy like ashwagandha by making certain modulations and modifications<sup>[10]</sup>.

The best-known use of Ashwagandha would be its property to diminish stress. It belongs to the class of Adaptogens, which aid to reduce the stress and depression. Ashwagandha does so by modulating the Hypothalamic-Pituitary-Adrenal (HPA) axis which controls your reaction towards depression<sup>[10]</sup>. Tests have established that Ashwagandha has effects which are similar to the effects of imipramine (Anti-depressants) in term of its anti-depression activities and researches promote the use of Ashwagandha Root Extract as mood stabilizers<sup>[12]</sup>. Ashwagandha also improves

memory and learning abilities. The chemical constituents of Ashwagandha; Withanolides A and D, Withaferin and Withaniamides are the major contributor for its anti-depressant activity<sup>[12]</sup>.

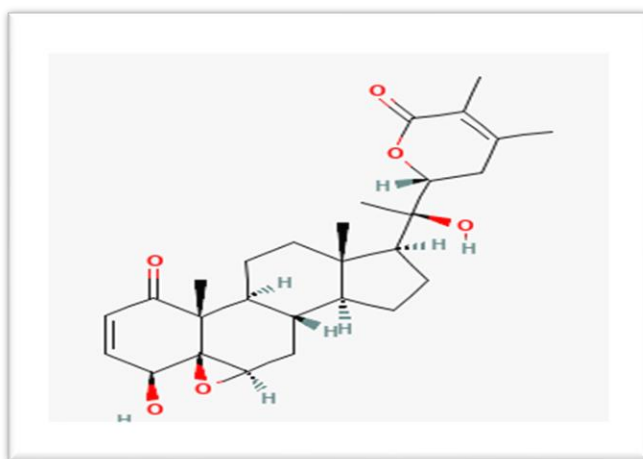


Figure 1 structure of Withanolides<sup>[12]</sup>

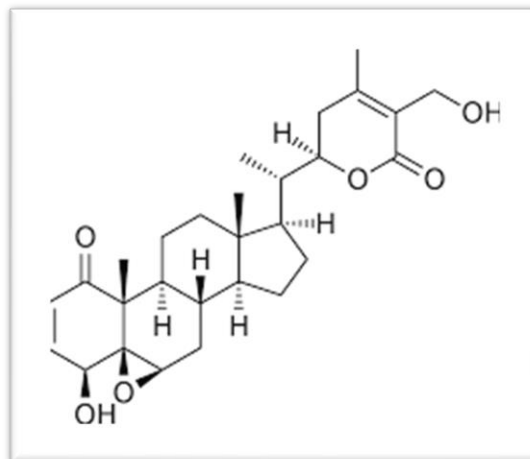


Figure 2 Structure of Withaferin<sup>[12]</sup>

The chemical constituents of Ashwagandha; Withanolides bind to the GABA receptors, enhancing the effect of GABA and inducing relaxation and sedation. It also binds to the serotonergic receptors to induce a state of calmness<sup>[5]</sup>. Ashwagandha may help balancing Dopamine levels which help in mood regulation and leads to a relaxed state and contributes to sleep. It also improves the quality of sleep by increasing the NREM (Non-Rapid Eye Movement) sleep, which helps in achieving a deeper level of rest<sup>[13]</sup>.

Ashwagandha can be taken in order to improve the quality of life and to get out of a depressed state of mind. Depression has been a major cause for majority of the health problems caused in today's time and has also caused a numeric number of suicides among youth in the current time<sup>[14]</sup>. The treatment of this can either be through a number of therapies or medicinally. Ashwagandha has been proven to be an effective and safe herbal medicine to cure depression.

## 2. Biological Activity

### 2.1 Treatment of Sleep Disorders:

Insomnia is characterized by the lack of the ability to sleep or by the lack in ability to stay in sleep which leads to them not meeting their quota of sleep which degrades their daytime functioning. Insomnia leads to poor sense of wellbeing, impairment of cognitive functions, lack of motivation and behavioral issues. Insomnia is generally caused by old age but is commonly reported in the youth due to increased stress levels in work place and personal life leading to degrade the quality of life in the youth<sup>[13]</sup>.

Currently used medications for sleep are seen to have side effects, so it was thought that the use of herbal medicines will provide an alternate therapy and will be able to treat Insomnia in a safer way. A study showed that the use of Ashwagandha root extract to patients for 10 weeks (300 mg of the drug, twice a day) improved the quality of sleep significantly and also made it easier to sleep<sup>[15]</sup>. Another study as performed on a group of old age patients (65-80) to check the safety and efficacy and tolerance of Ashwagandha root extract, it was seen that the drug was proven to provide a better quality of sleep and a better mental alertness and a better tolerance was observed. The tested drug was found to be safe and effective<sup>[16]</sup>.

### 2.2 Anxiolytic and Anti-Stress Activity

Stress is defined as the natural response of the body to internal and external stimuli. It is caused by increase in the cortisol levels and DHEA (dehydroepiandrosterone) levels. People who are constantly under pressure from their work and personal life are seen to experience stress and have a degraded quality of life. Stress is a major cause of disturbance of homeostasis<sup>[17]</sup>.

Ashwagandha has several mechanisms which act on decreasing stress levels. Firstly, Ashwagandha Root Extract is seen to have an effect on the HPA axis<sup>[18]</sup>. HPA axis in response to the stress increases the levels of Cortisol levels in the body and Ashwagandha decreases the Activity of the HPA axis which lowers the activity of cortisol causing decrease in the stress levels<sup>[18]</sup>. DHEA levels are associated with age as the levels of this hormone lowers with the age<sup>[18]</sup>. DHEA has proven to have a contributing effect on stress and has also been seen in middle aged patients and in patients associated with smoking and drinking<sup>[18]</sup>. Increased levels of stress also cause increase in oxidative and inflammatory actions which is also being lowered by the use of Ashwagandha<sup>[19]</sup>. A study was conducted using a sustained-release capsule containing Ashwagandha root extract (300 mg, Prolanza™). Participants took one Ashwagandha capsule daily for 90 consecutive days<sup>[19]</sup>. It was noted that treatment with *Withania somnifera* once

daily with one capsule significantly improved memory and attention, sleep quality, and overall psychological well-being. A reduction in stress levels was also noted<sup>[19]</sup>.

### 2.3 Adaptogenic Effect:

Adaptogens are defined as the class of metabolites that enhances body's ability to adapt to environmental factors and avoid the damage to the body that could imply. Ashwagandha, was studied for its adaptogenic effect<sup>[20]</sup>. The study investigated the adaptogenic activity of a novel withanolide-free aqueous fraction from the roots of *Withania somnifera* in rats and found that it exhibited significant anti-stress effects, including improved swimming endurance and reduced adrenal gland weight, without causing any adverse effects<sup>[21]</sup>.

*Table 1 Formulations of Ashwagandha<sup>[22]</sup>*

Product	Ingredients	Uses	Manufacturer
Ashwagandha Capsule	Ashwagandha	Anti-depressant, reduces stress and Adaptogenic <sup>[22]</sup>	Himalayan Organics
Ashwagandha Gold Plus	Ashwagandha root, Swarn Bhasm, Black Musli root, Gokshura fruit	Improve strength, Energy, Immunity, relive depression, Improve Stress <sup>[22]</sup>	Himalayan Organics
Ashwagandha Capsule	Ashwagandha	Improves stress <sup>[22]</sup>	Himalaya Drug Company
Mentat Syrup	Ashwagandha, Brahmi, Maddhukaparni	Enhances memory and learning capacity <sup>[22]</sup>	Himalaya Drug Company
Stress relief massage oil	Ashwagandha, Indian Tinospora, Country Mallow, Indian Madder	Relief Stress <sup>[22]</sup>	Himalaya Drug Company
Manoll Nutra Syrup and capsule	Ashwagandha, Yastimadhu, Guduchi, Amalaki,	Relief of stress and improved immunity <sup>[22]</sup>	Charak Pharma
Evanova Capsule	Soya, Ashwagandha, Brahmi,	Insomnia <sup>[22]</sup>	Charak Pharma
Sumenta Tablet	Ashwagandha, Brahmi, Jyotishmati, Tagar, Jatamansi	Protect neuron-damage <sup>[22]</sup>	Charak Pharm
Cognium Tablet and syrup	Ashwagandha, Shankhapushpi, Arjun, Jyotishmati, Brahmi,	Cognitive functions <sup>[22]</sup>	Charak Pharma
ZZOWIN Tablets	Ashwagandha, Tagar, Yashtimadhu, Jatamansi, Mandukparni, Pippali	Anxiety, relaxation, sleep deprivation <sup>[22]</sup>	Charak Pharma
Ashwagandha Churna and Capsule	Ashwagandha	Relieve stress <sup>[22]</sup>	Patanjali
Muniprajna Tablets	Brahmi, Shankhapushpi, Jyotishmati, Ashwagandha	Neuroprotection <sup>[22]</sup>	Muniyal Ayurveda
Ashwagandha powder and Capsules	Ashwagandha	Anti-stress <sup>[22]</sup>	Herbsforever
Stresscom Capsule and Syrup	Ashwagandha powder	Reduce anxiety, depression and stress <sup>[22]</sup>	Dabur
Ashwagandharishta	Ashwagandha, Mushali, Manjishtha, Haritaki, Haldi	Depression, Anxiety and Stress <sup>[22]</sup>	Dabur
Mood Elixir	Ashwagandha, Anantmool, Bramhi	Mood management <sup>[22]</sup>	Cureveda
Stress Shield	Ashwagandha, Jatamansi, Brahmi	Anxiety and stress support <sup>[22]</sup>	Cureveda
Ashwagandha Capsule	Ashwagandha	Relief stress <sup>[22]</sup>	Morpheme Remedies
Stress Suppress Capsule	Ashwagandha, Brahmi, Jatamansi, Tagara	Stress management <sup>[22]</sup>	Morpheme Remedies
Withania somnifera Mother Tincture	Ashvagandha	Reduce depression <sup>[22]</sup>	SBL

Alpitone syrup	Ashwagandha, Rasna, Shatavari, Bala, Gokshur, Draksha, Guduchi, Ginger, Chitrak	Reduced stress, anorexia, fatigue <sup>[22]</sup>	Zandu
AyurSip Stress Control	Ashwagandha, Brahma, Licorice, Vaca, Saunf, Amalaki, Jaiphal, Vidarikand, Mandukparni, Lavanga, Arjuna	Physical and mental stress <sup>[22]</sup>	Zandu
Ashwagandhahills Capsule	Ashwagandha	Antistress and revitalizer <sup>[22]</sup>	Herbal Hills
Avalife Stress-Free	Ashwagandha, Bacopa, Holy basil	Stress Relief <sup>[22]</sup>	Avalife
Ashwagandha Root Extract Capsule	Ashwagandha	Relief stress <sup>[22]</sup>	Avestia Pharma
Ashwagandha Bala Shatavari Oil	Ashwagandha, Shatavari, Bala	Nerve strengthening <sup>[22]</sup>	Herbsforever

### 3. Safety of Use:

Ashwagandha has been medicinally used for centuries and this long use of this herb indicates its safety. Researches have been conducted on the safety of this herb as a medication as to eliminate concerns regarding the use of Ashwagandha. The use of medicinal herbs has started nationally and internationally, hence to check the safety and efficacy of the medicinal herbs is highly important.<sup>[23]</sup>

Recent reports of hepatotoxicity caused by Ashwagandha root extracts have been reported. In 2004, a 20-year-old patient was diagnosed with congestive liver damage due to the withdrawal of Ashwagandha after a use of 2 months, the patient was recovered by the treatment with ursodeoxycholic acid and phenobarbitone<sup>[23]</sup>. Another patient in UK, who was a 39-year-old woman. She faced jaundice after the use of an over-the-counter herbal supplement containing Ashwagandha root extract<sup>[24]</sup>.

Another case of 41-year-old woman who had taken ashwagandha with progesterone was qualified for a liver transplant due to her deteriorating condition. Even though these cases are reported but the cases on liver damage are scarce and inconclusive hence further studies are required<sup>[25]</sup>.

A study conducted in India on a group of 80 fully healthy individuals confirmed the lack of toxicity of this raw material. The participants were each administered 300 mg of Ashwagandha root extract orally, twice daily for 8 weeks<sup>[26]</sup>. This was assessed by monitoring parameters such as body weight, systolic and diastolic blood pressure, hemoglobin, alkaline phosphatase, alanine transaminase, aspartate transaminase and plasma neutrophil and platelet counts. The values of the above indicators at the end of the study showed no significant differences between the group using the extract (40 subjects) and the group taking placebo (40 subjects)<sup>[26]</sup>. Thyroid function was also monitored by measuring blood levels of triiodothyronine, thyroxine and TSH; however, there were also no significant differences in the levels of these hormones<sup>[25]</sup>.

### 4. Contraindications:

Phytotherapy with Ashwagandha has become really common in these days but it should be kept into consideration that not all patients can take this drug<sup>[26]</sup>. Patients experiencing Hyperthyroidism and exhibiting symptoms like increases palpitations, restlessness, decreased libido cannot take this drug<sup>[26]</sup>. Ashwagandha has shown to increase the quantity of 3,3,5-Triiodothyronine (T<sub>3</sub>) and Tetraiodothyronine (T<sub>4</sub>) as an effect which is unfavorable in the condition of Hyperthyroidism<sup>[26]</sup>.

Patients with Prostate cancer should also avoid the usage of Ashwagandha root extract as this drug has also shown its effects in increasing testosterone hence is also used in the treatment of infertility, but for patients with prostate cancer, elevated levels of testosterone can intensify the progression of this disease<sup>[27]</sup>.

Women planning for pregnancy or pregnant women should also avoid the usage of Ashwagandha as usage of Ashwagandha may lead to miscarriage<sup>[28]</sup>.

Ashwagandha root extract may interact with anti-anxiety, sleep and sedative preparations, worsening their effects by synergism<sup>[29]</sup>. Ashwagandha exhibits additive effects with anti-convulsant and barbiturates which results in the increase of their side effects which are impaired motor control, muscle weakness, decreased libido and muscle tremors<sup>[29]</sup>.

It is clinically observed that Ashwagandha being and CYP3A4 (hormone) inducer can cause possible drug-raw material interactions which may worsen the side effects of a drug. Patients taking medications for hypoglycemia, hypotension and immune suppression should consult a doctor before taking an ashwagandha therapy<sup>[30]</sup>.

The drug should be avoided by patients having multiple sclerosis, lupus or rheumatoid arthritis as the immunostimulant effect of Ashwagandha may aggravate the effects of these diseases<sup>[31]</sup>.

## 5. Comparative study between Ashwagandha and Current medications:

### 5.1 Efficacy:

Ashwagandha is not mainly used as a first-choice medication for psychological disorders but its efficacy has been recorded to be at par with Imipramine(anti-depressant) during a test, hence it can be said that ashwagandha is highly efficacious drug for the use in psychological disorders<sup>[12]</sup>.

### 5.2 Side Effects:

Ashwagandha being a medicinal herb has very low proven side effects like GI trouble, headaches, lowered blood pressure and blood glucose levels<sup>[32]</sup>.

The currently marketed anti-depressants have more severe side-effects when compared to Ashwagandha like Sexual dysfunction, increase in weight, constipation which are commonly associated with anti-depressants<sup>[33]</sup>.

### 5.3 Onset of Action:

The effects of Ashwagandha can be seen in 2-3 weeks and improved mood may take a little longer to be observed<sup>[34]</sup>. The effects of Anti-depressants start to show in 3-4 weeks while betterment in the condition can only be observed in 8-12 weeks<sup>[35]</sup>.

## 6. Conclusion:

Ashwagandha is a medicinal herb with multiple therapeutic effects which can be used for the treatment of various ailments. This medicinal herb has been proven to be useful from a very long time. Researches are still being made to find even more of its therapeutic effects and optimal dosage. The optimal dosage regimen and its interactions with other drugs are yet to be studied and the major concern being its safety is also yet to be researched and determined. Ashwagandha has also been proven to be a better drug at efficacy and safety than the currently marketed formulations for depression.

The use of Ashwagandha for neurological disorders such as Stress, depression and Insomnia has proven to be effective and safer when compared to the currently marketed drugs but the mechanism of Ashwagandha for its other therapeutic uses aren't fully understood yet. Studies are going on to use this drug to its full potential and to cure many ailments with reduced side effects and to build new therapeutic strategies using Ashwagandha.

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