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A Review Article on *Aswagandha* (*Withania somnifera*) – The Natural Immunity Booster

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ABSTRACT:

Introduction - Ayurveda a holistic system of medicine, originated in India more than 3000 yrs ago. The main objective of Ayurveda is to “Maintain the health of healthy person and to pacify the disease of a diseased person”. Immunity is the ability of the body to resist against the various foreign agents. The concept of immunity, in fact had been rooted in Ayurvedic system of medicine much before 600 BC.

Material and Methods - In Ayurvedic classics Acharya’s has mentioned a lot of immune boosters, both single drugs and formulations. *Ashwagandha*, is one among them, which has got immense popularity recently, due to its ability to boost body immunity and also, it can increases body’s natural ability to fight viruses.

Discussion- *Ashwagandha*, a special herb, used extensively in Ayurveda and is known for its capacity to boost the immunity. The pharmacodynamic action of *Aswagandha* itself proves the immunomodulatory effects. The herb is *ushna* in potency thereby reduces *Kapha Vata*, providing more strength to the immune system of our body. Being *Madhura in rasa* it provides *ojas, bala* and nourishment to the *Dhatu*s.

Conclusion- An effort to compile the details about *Aswagandha* in relation to its immune boosting power was done here.

Keywords - Ayurveda, *Aswagandha*, Immunity, *Tridosha*

INTRODUCTION

Ayurveda a holistic system of medicine, originated in India more than 3000 yrs ago.¹ The base line of ayurvedic medical science are, the concepts of universal interconnectedness, body’s constitution, and life forces.² The main objective of Ayurveda is to “Maintain the health

of Healthy person and to Pacify the disease of a diseased person”. This alternative medicine keeps the body in balance and immune system at peak efficiency, so that the infections and inflammation seldom manifest. The balanced state is maintained by keeping all *Tridoshas* in



harmony within the body, and the imbalance of any one or two of the *Tridoshas* will lead to diseases. Thus in Ayurveda the treatment is based on the system of *Tridoshas*. This traditional system of medicine does not kill an infection like the antibiotics, instead it strengthens the body's immune system to fight disease or infection. From the Ayurvedic classics, one can find a good number of different areas, mentioning the concept of *Vyadhikshamatwa* (Immunity). This term is made up of two words:- *Vyadhi* – disease and *Kshamatva* – suppress or overcome. Therefore *Vyadhikshamatwa* means the factor which limits the pathogenesis and opposes the strength of disease. ³There are immense number of herbs, which are having good *Vyadhikshamatwahara* properties. These herbs can strengthen the body's natural defense mechanism by stimulating the natural killer cells, which helps in fighting with virus and bacteria in our body. One among them is “*Aswagandha*”, a herb which is considered as the natural immunity booster, as it can improve, the body's defense by improving the cell mediated immunity.

Aswagandha is a commonly and widely used herbal plant in Indian system of medicine especially in Ayurveda. ⁴The root of this plant smells like horse (*Ashwa*) hence, termed as *Aswagandha*. It has a lot of therapeutic power, even though it got its popularity as sexual power improving tonic to man like a horse. In classical texts of Ayurveda, this plant has a variety of names, named after a horse, like *Hayahwaya*, *Vajigandha*, *Vajinama*, etc.

Explanation of *Ashwagandha* is not found in Vedic literature but is elaborately described during the Samhita period. Most of the classical Ayurvedic *Samhitas* and *Chikitsa granthas* have mentioned various therapeutic effects of *Aswagandha* (both internally and externally). Synonyms, Properties, Actions and other details are found in almost all *Nighantus*.

MATERIAL AND METHODS

Botanical Name : *Withania somnifera*

Family Name : Solanaceae

Vernacular Name⁵

English : Indian ginseng

Sanskrit Name : *Aswagandha*

Hindi Name : *Asgandha*

Malayalam : *Amukuram*

Gujarat : *Asam, Asoda, Ghosasoda*

Marathi : *Asgundh, Kanchuki, Askandha*

Bengali : *Ashvagandh*

Punjabi : *Asgand*

Tamil : *Asuragandhi*

Telugu : *Asvagandhi, Penneru*

Urudu : *Asgandanagaori*

Synonyms⁶

- *Aswagandha* : It promotes sexual potency like a horse.
- *Balada* : It provides physical strength.
- *Balya* : It gives physical strength.
- *Gandhapatri* : Leaves of this plant also have horse like smell.
- *Gokarna* : Leaves resemble the cow's ear.
- *Hayahwaya* : It is popular by the name of horse
- *Kamaroopini* : It promotes skin complexion.
- *Marutaghni* : It cures *Vata vikaras*.
- *Vajikari* : It has aphrodisiac properties.
- *Vanaja* : It grows wildly.
- *Varada* : It acts as a blessing for patients.

Pharmacological Actions

The *Doshakarma* of *Aswagandha* is *Kapha Vatashamaka*. The main actions of this drug are *Rasayana* (Rejuvenating), *Balya* (Strengthening) *Brimhaniya* (Nourishing), *Vajikarana* (Aphrodisiac), *Shothaghna* (Anti inflammatory), *Kantiprada* (Skin Brightening). Other actions includes *Deepana* (Appetizers), *Anulomana* (Laxative), *Shoolaprashmana* (Pain Killers), *Vedanasthapana* (Pain Reliever), *Krimighna* (Antimicrobial), *Raktashodhaka* (Purifies Rakta), *Kaphaghna* (Reduces Phlegm), *Shwasahara* (Respiratory Action), *Mootrala* (Diuretics), *Kushthaghna* (Skin Disorders)⁷.

It is been reported that, *Aswagandha* has numerous pharmacological properties like Immunomodulatory, Neuro pharmacological, Anti inflammatory, Antitumor, Antibiotic, Anticancer, Chemoprotective, and Hepatoprotective. Other effects include Anti-Parkinson's, Antiproliferative, Neuro protective, Cardioprotective, Hypoglycemic, and Hypolipidemic, Anticonvulsant, Antifungal, Antistress, Antibacterial, Antimalarial, Herbicidal, Gamma aminobutyric acid mimetic activity. Nephroprotective and Nephrocurative, Antiaging, Antioxidant, Rejuvenating, Hemopoetic, Adaptogenic and Aphrodisiac⁸.

Indications

It is indicated in *Kshaya* (Consumption), *Kshata* (Injury), *Daurbalya* (Weakness), *Shotha* (Odema), *Klaibya* (Infertility), *Kasa* (Cough), *Shwasa* (Dyspnea), *Switra*

(Leucoderma), *Vrana* (Wound), *Visha* (Toxin), *Kandu* (Itching) and *Krimi* (Microbes). It is commonly used in emaciation of children (when given with milk, it is considered as the best tonic for children). It is also useful in debility from old age, Rheumatism, in vitiated conditions of *Vata*, Nervous breakdown, Insomnia, Leucoderma, Goiter, Constipation etc. It helps in conditions like chronic fatigue, dehydration, impotency, bone weakness, looseness of joints and teeth, severe thirst, premature ageing and emaciation.

Part used

Roots, leaves, fruit

Dosage : 3 to 6gm

Therapeutic Applications

External Uses

1. *Granthivisarpa* (Erysipelas type): Apply a warm paste of *Aswagandha* to the affected area.
2. *Urusthambha* (Thigh stiffness): Mix *Aswagandha* Root powder with Honey, Mustard oil, and Anthill earth and apply as a paste locally in *Urusthambha*.
3. *Kustha* (Skin diseases): Carbuncles, Ulcers, and Painful swellings are treated using a paste made from roots and bruised leaves. Localized application of root paste reduces joint inflammation⁹.

Internal Uses

1. *Kshaya* (Consumption): *Ashwagandha*, *Tila*, and *Masha* powders are mixed with goat's ghee and honey¹⁰.
2. *Balashosha* (Emaciation): Emaciated children are fed with ghee processed with one-fourth paste of *Aswagandha* and ten times milk to promote the bodily mass¹¹.
3. *Rasayana* (Rejuvenator): *Aswagandha* combined with milk, ghee, and oil and taken with warm water for 15 days helps to enhance body mass. In order to improve intellect, life span, stability, and strength, *Mandukparni*, *Shankhapushpi*, *Ashwagandha*, and *Shatavari* should be used¹².
4. *Shwasa* (Asthma): *Aswagandha's* Alkali (Ash) should be taken with honey and ghee¹³.
5. *Nidranasha* (Insomnia): *Aswagandha* powder, combined with sugar and consumed with ghee, heals insomnia and helps you fall asleep quickly¹⁴.
6. *Bandhatva* (Infertility): Women should drink *Aswagandha* processed milk with ghee when they are ready to conceive¹⁵.

Toxicity and Negative Effects

Purified *Aswagandha* extract is safe in rats up to 2,000 mg/kg by weight, according to OECD recommendations (at a dosage level of 1,000 mg/kg for 90 days to rats)¹⁶.

In a rat model of chronic stress, the activity of *W. somnifera* extract was almost equivalent to *Panax ginseng* extract without any side effects. In humans, no adverse events were recorded after taking up to 3 g of *W. somnifera* extract tablets for a year¹⁷.

Adulteration and Substitution

Ashwagandha is used as a replacement for *Kakoli* and *Kshirakakoli* of *Ashtavarga*.

Effects of *Aswagandha* in Some of the Most Important Immunity Related Diseases

1. Covid-19

Coronavirus disease or COVID-19 is an infectious disease caused by the SARS-CoV-2 virus. This Pandemic disease affects the whole world, made the "Earth relax and Human dies". The main Protease (M^{Pro}) of SARS-Cov-2 is playing a major role in disease propagation, by processing the polyproteins which are required for its replication. So the significant target for Drug Discovery forms these Protease. Even though there is no significant registered medicines against this virus, yet to be found, we can fight by improving our bodily immune system as it supports natural ability of body to defend against the foreign bodies and other pathogens. Our body has the ability to fight against all the disease with the help of its own immune power. So one with good immunity is not only less susceptible to virus, but can recover quickly without any complication, even if affected. Thus foremost motto to get protected from this pandemic, is to boost up our immunity. *Withania somnifera* is a widely prescribed Ayurvedic herb known for its Immunomodulatory, Antiviral, Anti-inflammatory, Adaptogenic properties. The natural chemical constituents from *Aswagandha* can boost the body immunity and increase the body's ability to fight disease. The Chemical constituent called Withanone, a steroidal lactone present in the roots of *Aswagandha* has the ability to block the entry of virus through the membrane.

Research Studies in *Aswagandha* related to Covid-19

- A Study was conducted to find the Efficacy and Safety of *Aswagandha* in Prophylaxis against Covid-19 in high risk Health care workers (HCW) in comparison to Hydroxychloroquine. And it is been found that *Aswagandha* was not found inferior to Hydroxychloroquine, and its efficacy was within the 15% non-inferiority margin set a priori.
- A study was conducted to evaluate the potential of 40 natural chemical constituents of *Aswagandha*, in order to explore the possible inhibitor against the main Protease of

SARS-CoV-2. The Docking study revealed that among the 40 chemical constituents, 4 constituents such as Withanoside II, Withanoside IV, Withanoside V, Sitoinoside IX shows the highest docking energy. In the conclusion its found that Withanoside V may serve as a potential inhibitor with antiviral effects also.

- Effects of *Aswagandha* was studied in participants vaccinated against COVID-19 vaccine (COVISHIELD) on safety, immunogenicity and Protection in healthy population As the variants of SARS- CoV2 virus and the mutants are inevitable.

2. Rheumatoid arthritis

Rheumatoid arthritis or RA, is an autoimmune and inflammatory disease in which our immune system attacks healthy cells in our body by mistake, leading to inflammation in the affected parts of the body. RA mainly attacks the joints, that too many joints at once, like joints in the hands, wrists, and knees etc. In a joint with RA, the lining of the joint becomes inflamed, which damages the joint tissue causing long-lasting or chronic pain, unsteadiness, and deformity. RA can also affect other tissues throughout the body and cause problems in organs such as the lungs, heart, and eyes. Ayurveda is considered as a widely practiced system of traditional medicine in India. Occurrence of stress is widely recognized as an important risk factor in the aetiology of inflammatory rheumatic diseases. The herb *Withania somnifera* (*Ashwagandha*) exhibits anti-inflammatory, anti-tumour, anti-stress, antioxidant, immunomodulatory, hematopoietic and rejuvenating properties, which shows the effectiveness of *Aswagandha* in the treatment of RA. Because of its pharmacological and medicinal properties, *Aswagandha* is used to treat various diseases including arthritis. As per Ayurveda, the disease arthritis links to the health of the joints, gut and the immune system. With the use of *Rasayana* herbs one can strengthen the immune system. *W.somnifera* is well known for its *Rasayana* (rejuvenator and immunomodulatory) properties and is effective in treating inflammations.

Research Studies in *Aswagandha* related to Rheumatoid Arthritis

- A study was carried out to evaluate the efficacy and safety of Ayurvedic treatment (*Ashwagandha* powder and *Sidh Makardhwaj*) in patients with rheumatoid arthritis. *Ashwagandha* and *SidhaMakardhwaj* treatment decreased RA factor. A significant change in post-treatment scores

such as tender joint counts, swollen joint counts, physician global assessment score, patient global assessment score, pain assessment score, patient self assessed disability index score and ESR level were observed as compared to baseline scores.

- To compare the acute and chronic anti-inflammatory effect of *Withania somnifera* with Corticosteroid (Hydrocortisone). Maximum percentage inhibition of edema exhibited with 12 mg/kg & 25 mg/kg of ethanolic extract of *Withania Somnifera* at 3 hrs were 36.36 % and 61.36 % respectively as compare to standard drug Hydrocortisone (40 mg/kg s.c.) 65.91%

3. Neurodegenerative disorders

Alzheimer, Parkinson, Huntington, and amyotrophic lateral sclerosis are only a few examples of the important class of neurological conditions for which there is now no treatment. They are distinguished by an irreversible loss of a certain kind of neurons. A typical pattern of illness progression is the selective susceptibility of particular neuronal clusters (usually a subcortical cluster) in the early stages, followed by the extension of the disease to higher cortical areas. Protein aggregation, mitochondrial dysfunction, glutamate toxicity, calcium load, oxidative stress, neuro-inflammation, and aging are only a few problems that are common to neurodegenerative illnesses and lead to neuronal mortality. The fact that efforts to cure these disorders frequently focus on only one of the aforementioned pathological alterations while disregarding others severely restricts their effectiveness. PD is a neurodegenerative condition, which is characterized by muscle rigidity, tremor and bradykinesia. The development of PD is caused by a decrease in dopamine levels in the parts of the brain that control motor movements. In the brains of people with Parkinson's disease, oxidative stress is the main cause of neurodegeneration. Alzheimer's disease (AD) is a progressive, neurodegenerative condition marked histochemically by extracellular amyloid beta (A beta) protein deposits and intracellular neurofibrillary tangles in the cortical and limbic regions and is considered as the most prevalent cause of dementia in older people.

Research Studies in *Aswagandha* related to Neurodegenerative Disorders

- In both in vitro and in vivo experiments, withanolides have demonstrated effective neural network reconstruction. It has been demonstrated that *Aswagandha* extract including Withanolide-A, Withanoside-IV, and Withanoside-VI effectively promotes axonal regeneration and synaptic

rebuilding. Sominone has been reported to induce axonal regeneration and synaptic reconstruction in brain and enhance object location memory.

- *Ashwagandha* has reportedly been shown to have positive effects on parkinson's disease in a number of experimental animals. In a dose-dependent manner, *Ashwagandha* extract has been shown to reverse neurobehavioral deficits, increased lipid peroxidation and decreased glutathione content.
- By lowering the level of pro-apoptotic proteins and raising the level of anti-apoptotic proteins in the experimental model, *Aswagandha* supplementation was demonstrated to reduce apoptotic cell death in Parkinson's disease.
- Experimental models of alzheimer's disease's behavioral deficits and pathological signs have been shown to be reversed by *Aswagandha* extract . Studies showed WS mediated reversal of -amyloid induced toxicity in some neuronal cells and also reversed amyloid-induced reduction in spine density, spine area, spine length, and spine number, indicating protective impact of *Aswagandha* in alzheimer's disease

DISSCUSSION

Ashwagandha is considered as a special herb, used extensively in Ayurveda and is known for its capacity to boost the immunity. It is called as Indian ginseng or winter cherry and is a small evergreen shrub, growing in India, Middle East, and parts of Africa. The pharmacodynamic action of *Aswagandha* itself proves the immunomodulatory effects. The herb is *ushna* in potency thereby reduces *Kapha Vata*, providing more strength to the immune system of our body. Being *Madhura in rasa* it is providing *ojas, bala* and nourishment to the *Dhatu*s. This in turn shows its good effect in boosting our immunity. *Aswagandha* acts a tonic or **Rasayana** in **Ayurvedic** medicines, means, it rejuvenates both physically and mentally. *Aswagandha* reduce stress and increases the number of White Blood Cells (WBCs), which forms the body's inbuilt defense mechanism. This herb can boost the energy levels, lifting both stamina and endurance abilities, giving vitality like that of a horse. **Ashwagandha** was traditionally used for inflammation, thereby helps to relieve joint pain, because of which it is considered for the treatment of arthritis. With its powers of improving memory, *Ashwagandha* can be used to treat Alzheimer's, Parkinson's and other neurodegenerative disorders.

CONCLUSION

As per modern medicine, immunomodulators are considered as one of the most potent tools in the management of health and disease. In Ayurvedic practice, the immune enhancement is achieved by the use of the *Rasayana* and *Vajikarana* therapy. *Ashwagandha* being a *Rasayana* benefits the body by assisting it with dealing stress, and making it an adaptogen. It contains a very high amount of Withanolides, which fight tumor growth and inflammation. *Ashwagandha* benefits both the body and brain. It's known to lower blood sugar, reduce stress levels, help with anxiety or depression. It additionally improves brain function and concentration. *Ashwagandha* helps to reduce inflammation, by increasing the availability of the body's natural killer cells. These cells can fight inflammation, infections, and disease, thereby making *Ashwagandha* a daily option to fight against all diseases.

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