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Review Article

# *ASHVAGANDHADHYA GHRITA*–A CLASSICAL FORMULATION IN A NEW PERSPECTIVE

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**ABSTRACT**

*Ashvagandha* (*Withania somnifera*) is an important drug of Ayurvedic therapeutics. It is found almost all over India and the part used chiefly is root. This root smells like horse's urine and so the name - *Ashvagandha*. Due to its multiple beneficial properties it is known as 'Indian ginseng'. Somnifera in Latin means 'sleep inducing' implicating its calming effect.

*Ashvagandhadhya Ghrita* is a classical formulation stated in chapter of *Vata Vyadhi* in the text *Chakradutta*. It is prepared with ingredients- *Ashvagandha Kvatha* (decoction), *Ashvagandha Kalka* (paste), *Go-dugdha* and *Go-ghrita*. The individual ingredients of this formulation have *Rasayan*, *Medhya* etc. properties. *Rasayan* means that which promotes physical and mental health, helps to increase the body's capacity to overcome diseases and diverse stress factors. It also enhances longetivity. Today, on similar line is concept of adaptogen- that which helps the body to face better the situations which produce stress and its related effects in body. *Medhya* means which is beneficial for intellect and memory.

Moreover this is a formulation of *Sneha Kalpana* containing *Ghrita* as its base. It is known that blood brain barrier allows lipid soluble drugs to easily pass into the brain and thereby act on central nervous system.

Thus looking to properties of individual ingredients and *Kalpana* (dosage form) it is hypothesized that the formulation as a whole also would have *Rasayan* i.e., adaptogenic and memory enhancing effect whereby it would be useful in conditions ranging from stress to anxiety to neurodegenerative diseases like Alzheimer's disease etc.

**KEYWORDS:** *Ashvagandhadhya Ghrita*, adaptogen-antistress, memory enhancer, Alzheimer's disease, blood brain barrier.

## INTRODUCTION

In the present era of cut throat competition, life of today has become full of stress and anxiety which has been found to lead to various diseases ranging from hyperacidity to diabetes mellitus, insomnia, hypertension etc. The treatment offered today doesn't provide very satisfactory results and so a solution is sought for from other sciences. Ayurved's R*asayan* concept has a great potential for being the answer to this malady. *Rasayan* are those drugs which promote longevity, memory, intelligence, health, youthful state, appropriate functioning of the *Indriyas* i.e. sense organs etc. *Goghrita* (cow's ghee) and *Godugdha* (cow's milk) also have the properties which help to maintain and sustain the physical and mental health - being *Rasayan*, beneficial for the intellect, memory etc. *Ashvagandha* is a well known R*asayan* drug and numerous studies have shown its antistress-adaptogenic etc. properties. A classical formulation - *Ashvagandhadhya Ghrita* is a formulation stated under the chapter of *Vata Vyadhi* in the text *Chakradutta.* It constitutes of the above mentioned ingredients i.e.,it is prepared with *Ashvagandha Kvatha* (decoction), *Ashvagandha kalka*(paste), *Godugdha* and *Goghrita*. So far no work has been done with this reference.

Moreover this formulation belongs to the *Sneha* K*alpana* i.e it is a lipid containing dosage form. The blood brain barrier allows lipid soluble drugs to easily penetrate into the brain and thereby act on the central nervous system.

Thus looking to the properties of the individual drugs it may be hypothesised that this classical formulation may prove to be an antistress –adaptogenic and memory enhancing drug. Hence the same was put forth for animal experimentation the findings of which could open new vistas for the treatment of diseases from stress, anxiety to neurodegenerative diseases like Alzheimer's disease –a grave disorder of today's time.

## MATERIALS AND METHOD

Review of classical literature and various works done – the published details are the major source.

### General properties of *Ashvagandha*

As per the text *Bhavprakash*, *Ashvagandha* mitigates the V*ata Dosha* and *Kapha Dosha*, leucoderma, tuberculosis, endows strength, is *Rasayan*, bitter, astringent, hot in potency and great producer of semen. [1] *Ashvagandha* has tonic, aphrodisiac, anti-inflammatory, diuretic, anthelmintic, astringent and stimulant properties. It is used in - emaciation in children where it is given with milk, debility from old age, rheumatism, vitiated conditions of *Vata*, leucoderma, constipation, Insomnia, nervous breakdown, goitre etc. [2]

Years of use of *Ashvagandha* in the Ayurvedic medical system has revealed that it has pharmacological value as an adaptogen, antibiotic, aphrodisiac, astringent, anti inflammatory, deobstruent, diuretic, narcotic, sedative and tonic drug. It provides potent antioxidant protection, activates the immune system cells such as lymphocytes and phagocytes, counteracts the effects of stress and promotes general well-being. [3]

**Anti stress- Adaptogenic effect**

Studies have shown that it is an adaptogen/ antistress agent –it increased the stamina of rats during swimming endurance test and prevented the adrenal gland changes in ascorbic acid and cortisol content produced due to swimming stress. *Ashvagandha* treated animals showed a significant increase in the duration of swimming time as compared to control. The control group of mice swam for a mean time of 385 minutes, whereas the drug-treated animals continued to swim for a mean duration of 740 minutes. i.e. the swimming time was approximately doubled after *Withania somnifera* treatment[2]. Thus it appears to induce more tolerance or increased resistance during stress.

A study was carried out at Calcutta with standardised extract of *Ashvagandha* root on a rat model of chronic stress. The method for producing stress was to give mild and unpredictable foot shock once daily for 21 days to adult male Wistar rats. This chronic stress induced various problems like significant hyperglycaemia, glucose intolerance, increase in plasma corticosterone levels, gastric ulcerations, male sexual dysfunction, cognitive deficits, immune-suppression and mental depression. These chronic stress induced perturbations were attenuated by *Ashvagandha* extract (25 and 50 mg/kg) administered 1 hour before foot shock for 21 days. Thus the result showed that *Withania somnifera* i.e. *Ashvagandha* alike *Panax ginseng* had significant antistress –adaptogenic activity. The advantage being that *Ashvagandha* didn't produce any side –effects like *Panax ginseng* namely the *ginseng* abuse syndrome - a condition characterised by high blood pressure, water retention, muscle tension and insomnia.[3]

Research carried out at Department of Pharmacology, University of Texas health science centre showed that extracts of *Ashvagandha* produce a GABA- like activity which maybe the reason of the plant's anti-anxiety effect. The function of this activity is to decrease neuron activity and inhibit nerve cells from over firing. This produces a calming effect. Enhanced neuron activity can lead to restlessness and insomnia, but GABA inhibits the number of nerve cells that fire in the brain and helps to sleep, uplift the mood and decrease anxiety. Research also revealed that *Ashvagandha* produces an anti-depressant and anti-anxiety effect in rodents comparable to the anti-depressant drug imipramine and the anti-anxiety drug lorazepam without having any side effects. [3]

*Ashvagandha* also prevented stress induced ulcers of the GI tract, either produced chemically or by stress. It showed significant protection against 18 hour immobilization, cold plus immobilization for 4 hours and aspirin induced gastric ulcers and lowered the mean ulcer index in rats. [2]

The chemical constituents like sitoindosides and acylsterylglucosides in it are anti-stress agents. Active principles, for instance the sitoindosides VII-X and Withaferin-A, have been shown to have significant anti-stress activity against acute models of experimental stress.[4]

Also the glycosides - sitoindoside VII and VIII present in *Ashvagandha* are reported to have anti stress activity. [5]

**Memory enhancing effect or nootropic effect**

In Ayurved, *Ashvagandha* is stated as a *Medhya Rasayan* drug which means that it promotes longevity and is particularly beneficial for cognitive functions i.e. for appropriate functioning of the brain and thereby the mental abilities.

Studies have found that it improves memory, increases spatial and visual memory, decreases oxidative brain stress and helps prevent nerve cell degeneration.

It has a cognition promoting effect and benefitted children with memory deficit and was found to be useful in loss of memory in people of old age. It was also found useful in neurodegenerative diseases such as Parkinson's, Huntington's and Alzheimer's disease.[4]

The glycowithanolides- sitoindoside IX and sitoindoside-X were evaluated for their immuno-modulatory and CNS effects like antistress, memory and learning in laboratory animals as the plant is used traditionally for similar purpose. Both these compounds (50 – 200mg/kg) produced significant anti stress effect in albino mice and rats. They also promoted learning acquisition and memory retention in both young and old rats. Thus these findings authenticate the use of *Ashvagandha* to improve cerebral functions in the geriatric population and to provide nonspecific host defence. [5]

For years, *Ashvagandha* has been prescribed for cerebral disorders in the elderly including memory loss. Research by a scholar from the university of Leipzig showed its effect on the neurotransmitters of the brain. *Ashvagandha* lead to more acetylcholine receptor activity and thereby he concluded that the increase of activity in that particular neurotransmitter could account for the increase in cognitive ability and memory which is attributed to *Ashvagandha*. [5]

It has been also found that oral administration of withanoside IV significantly improved memory deficits in Abeta-injected mice and prevented loss of axons, dendrites, and synapses. Sominone, an aglycone of withanoside IV, was identified as the main metabolite after oral administration of withanoside IV. Sominone induced axonal and dendritic regeneration and synaptic reconstruction significantly in cultured rat cortical neurons damaged by Abeta. Thus withanoside IV may ameliorate neuronal dysfunction in Alzheimer's disease (a chief cause of senile dementia).[4]

In another study animals treated with reserpine also showed poor retention of memory in the elevated plus maze task paradigm. It was observed that chronic use of *Ashvagandha* significantly reversed the reserpine induced retention deficits. [3]

Yet another study with *Withania somnifera* root extract improved retention of a passive avoidance task in a

step down paradigm in mice. *Withania* has also shown to reverse the scopolamine induced disruption of acquisition and retention and attenuated the amnesia produced by treatment with electroconvulsive shock(ECS), immediately after the training. Chronic treatment with ECS for six consecutive days at 24 hour intervals, disrupted memory consolidation on day seven. Daily administration of *Withania somnifera* for six days significantly improved memory consolidation in the mice receiving chronic ECS treatment. *Withania somnifera* administered on day seven also attenuated the disruption of memory consolidation produced by chronic treatment with ECS. On the elevated plus maze, *Withania somnifera* reversed the scopolamine induced delay in transfer latency on day one. On the basis of these findings, it is suggested that *Withania somnifera* exhibits nootropic like effect in naive and amnesic mice. [3] Thus, *Ashvagandha* does have adaptogenic and memory enhancing properties as well as being useful in neurodegenerative diseases like Alzheimer's disease etc.

***Goghrita***

This is clarified butter from cow's milk by preparing curd then butter-milk and churning this with water to obtain butter which is then heated till moisture evaporates and scum separates out and then filtered.

As per Ayurved as stated in the text *Astanghridaya*, *Goghrita* is beneficial for the intellect, memory, digestion (*Jatharagni*), strength, semen and eyes. It is useful for child and the aged.[6] As it aids in better digestive power it produces appropriate *Dhatu* (body tissues) and thereby helps to maintain the body and health.

***Godugdha***

Milk i.e. here *Godugdha* (cow's milk) has the properties of being *Rasayan*, *Medhya* (beneficial for the intellect, memory and mental abilities*)* and is also *Jivaniya* (endows vitality in life and increases life span).[7]

***Ashvagandhadhya Ghrita***

This classical formulation is described in *Cakradutta* [8] for the treatment of V*atavyadhi* and has the above three i.e., *Ashvagandha*, *Goghrita* and *Godugdha* as its ingredients.[8] i.e., it is prepared as follows.

**Ingredients**

*Goghrita*-1 part

*Ashvagandha Kalka* (paste)- 1/4$^{th}$ part

*Ashvagandha Kvatha* (decoction)- 4 parts [the decoction is prepared by adding eight times water to the Y*avakuta Churna* (coarse powder) of *Ashvagandha*, heating it till reduced to 1/4$^{th}$ part, then filtered and taken for use].

*Godugdha* -4 parts

**Procedure:** The paste and decoction of *Ashvagandha* root are prepared and this along with *Goghrita* and *Godugdha* are put together in a vessel and heated till all moisture evaporates as indicated by the tests of this K*alpana* (dosage form) i.e., S*neha Kalpana*. Then it is filtered and the *Ghrita* obtained is allowed to cool and then stored in appropriate container.

Moreover as seen above *Ashvagandhadhya Ghrita* is prepared by *Sneha Kalpana* procedure i.e. it has a lipid base. It is well known that the blood brain barrier allows lipid soluble substances to easily enter the brain and thereby act on the central nervous system. [9]

Thus on the basis of above information the following inferences can be drawn from the discussion given below.

**INFERENCE AND DISCUSSION**

So looking to the above i.e. the properties of the individual drugs it was observed that this formulation may have the properties of being an adaptogen-antistress drug and also may help in enhancing the memory.

Classically as per *Acharya Charaka, Vayu* is '*Tantrayantradhar'* and '*Niyantaprerentaca Mannasaha'* [10] - means V*ata Dosha* is responsible for appropriate functioning of the body and body organs. Moreover it initiates the mind for conducting its functions and also controls it so that it works appropriately. The sense organs also are capable of perceiving their respective subjects due to *Vayu*. In short, *Vata Dosha* is responsible for initiation and smooth conduction of all the bodily functions and maintaining the body. Particularly, amongst the five types of *Vayu*, *Udana* and *Prana vayu* are related with mind, *Uthsaha* (enthusiasm), functioning of all *Indriya* (sense organs) etc.[11] Thus vitiation of *Vata* leads to disruption of these functions. *Ashvagandhadya Ghrita* in *Cakradutta* has been stated for the treatment of *Vata Vyadhi* and so it can be inferred that it will pacify the vitiated *Vata Dosha*. So this formulation can be helpful in rectifying the vitiated *Prana* and *Udana Vayu* and thereby carry out their functions appropriately.

The ingredients of this formulation, as seen above, are *Rasayan*, beneficial for the intellect, memory and *Balya*. Moreover as stated above the formulations being *Ghrita* i.e., lipid based so it will be able to enter the brain as blood brain barrier allows lipid soluble drugs to penetrate and enter the brain and thereby act on the central nervous system.

**CONCLUSION**

In short, from the above context it is can be interpreted and inferred that *Ashvagandhadya Ghrita* contains adaptogenic –antistress and also memory enhancing property. Hence it was decided to study these effects of *Ashvagandhadya Ghrita* with the help of animal experimentation.

It can also be inferred that this formulation can be useful in conditions ranging from stress, anxiety to neurodegenerative diseases like Alzheimer's -a grave disease of today's time.

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