

GHRITA KALPANA WITH SPECIAL REFERENCE TO CLASSICAL FORMULATION-
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ABSTRACT

Ghrita Kalpana is an important *Kalpana* of Ayurveda, used both to maintain the health and to treat and cure diseases. It has a wide range of application being used internally as well as externally. It is a lipid containing *Kalpana* and as is known lipid containing formulations easily pass through the bbb-blood brain barrier thereby effective and acts on the central nervous system. Moreover, *Ghrita* has *brhman* (nourishing and body mass enriching) and *jivaniya* properties helping towards constituting a healthy body and thereby counteracting the catabolic effects of old age. *Ashwagandhadhya ghrita* is a classical formulation from *Cakradutta*, containing *go-ghrita*, *go-dugdha*, *Ashwagandha kalka* (paste) and *Ashwagandha kwatha* (decoction). These ingredients have *Medhya*, *brhman*, *jivaniya*, *rasayan* etc. properties and so it was studied to see whether this formulation has nootropic effect in swiss albino mice and was subjected to analysis of HPTLC and GC-MS to study the active constituents. Results showed that it had significant memory enhancing effect on Swiss albino mice. Analysis showed it contains Withanoside IV and Withanone -both of these are associated with neuroprotective property and are useful in learning and memory and in ameliorating dementia as per different studies-and GC-MS study showed that there is presence of omega 3 fatty acids like Linolenic acid, EPA (Eicosapentanoic acid) and DHA (Docosahexanoic acid) which also are useful for functioning of the brain. Hence, in light of above this formulation needs further research to see its potential in geriatric conditions like dementia, neurodegenerative diseases like Alzheimer's, Parkinson's etc. and also to maintain mental health in geriatrics.

KEYWORDS: Ashwagandhadhya ghrita, Withanoside IV, Withanone, Omega 3 fatty acids, Alzheimer's, neurodegenerative diseases.**INTRODUCTION**

Geriatrics is the branch which deals with the condition of old age, the bodily and mental changes occurring therein and the diseases specific to this age like amnesia, neurodegenerative diseases like Alzheimer's, Parkinson's disease etc.

Ghrita kalpana are *Sneha kalpana* formulations. By *ghrita* we understand to use *go- ghrita* (Cow ghee). The *ghrita kalpana* is generally prepared with *kalka* (paste of ingredients), *sneha dravya* (generally *go-ghrita* i.e. cow ghee) and *drava dravya* (liquids like *go- dugdha*, decoction etc.) heated together on *mandaagni* (mild

heating) till *paka pariksha* (wick is formed of the paste when it is rubbed between finger and thumb, no sound should be produced when a drop or two is put in fire etc.) are observed and then filtered to get the end product. It is known as medicated *ghrita* in today's context. *Go- ghrita* has the properties of being beneficial for the intellect, memory, digestion (*Jatharagni*), strength, semen and eyes. It is useful for child and the aged.^[1] As it aids in better digestive power it produces appropriate *Dhatu* (body tissues) and thereby helps to maintain the body and health. Also, it is known that bbb - blood brain barrier allows lipid soluble drugs to easily pass into the

brain and thereby effectively act on central nervous system.^[2]

Ashwagandhadhya Ghrita is a classical formulation stated in chapter of *Vata Vyadhi* in the text *Chakradutta*.^[3] It is prepared with ingredients- *Ashwagandha Kvatha* (decoction), *Ashwagandha Kalka* (paste), *Go-dugdha* and *Go-ghrita*. The individual ingredients of this formulation have *Rasayan*, *Medhya*, *Jivaniya* (promotes vitality) 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 longevity. 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 and as stated 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 was 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.

Thus in context of above a study was carried to study the learning and memory enhancing effect of this classical formulation.

MATERIALS AND METHOD

Pharmacological study was carried out on Swiss albino mice through Transfer latency test in mice (Kulkarni, 1999) using scopolamine to induce amnesia to see the effect on learning and memory.

Analytical study was done with HPLC and fatty acid profiling by GC-MS to find the constituents and see whether it had such active constituents as would be helpful in learning and memory enhancing effect and as contains *Ashwagandha* to see any of its active constituents are present or not.

RESULTS

The pharmacological study showed that *Ashwagandhadhya ghrita* had a learning and memory enhancing effect at a significant level.

The HPLC study showed that there is presence of Withanone and Withanoside IV and GC-MS study showed presence of omega 3 fatty acid like EPA, DHA and linolenic acid.

DISCUSSION

In the elevated plus maze paradigm scopolamine was used to induce amnesia in the mice. This cholinergic muscarinic antagonist is widely used to induce amnesia

in the experimental animals. Studies show that acetylcholinesterase inhibitors, which enhance the availability of acetylcholine (ACh) in the synaptic cleft, were able to reverse the scopolamine-induced deficit, indicating a neurotransmitter role of ACh in learning and memory. Muscarinic type 1 receptor antagonists, such as pirenzepine and the nicotinic antagonist mecamylamine, also have a negative effect on learning and memory performance. Also, many brain lesion studies in which specific cholinergic deafferentation of different brain structure have yielded a decline in cognitive performance.^[4] Thus there is a role of ACh in memory and learning and from the above it can be inferred that *Ashwagandhadhya ghrita* acts at the neurotransmitter ACh level.

Further, HPLC analysis of *Ashwagandhadhya ghrita* showed the presence of Withanone and Withanoside IV. Both of these are associated with neuroprotective property and are useful in learning and memory and in ameliorating dementia. A study indicated that besides cholinergic blockade, scopolamine-induced memory loss may be associated with oxidative stress and that *Ashwagandha* leaf extract or its purified component-withanone showed recovery from this and may serve as potential preventive and therapeutic agents for neurodegenerative disorders.^[5] Thus withanone present in *Ashwagandhadhya ghrita* may act at this level.

It has been found that oral administration of withanoside IV significantly improved memory deficits in Abeta (beta amyloid)-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).^[6]

Acharya Charaka states *Ghrita* to be *Smritivi vardhak* and *Buddhi vivardhak* i.e. promotes memory and intellect.^[7]

Ghrita contains unsaturated fatty acids like Docosahexaenoic acid- DHA- Omega-3 long-chain polyunsaturated fatty acid, which is a major component of retinal and brain tissues and remains important in prevention of various diseases.^[8] *Godugdha* i.e. cow's milk is considered to increase the *Oja* (essence of all the body tissues) and is *jivaniya* and *rasayan*.^[9] A research conducted suggests that drinking milk could improve the functions of the brain.^[10]

Ayurvedic perspective

Classically, as per *Acharya Charaka*, *Vayu* is „*Tantrayantradhar*“ and „*Niyantaprarentaca Mannasaha*“ - means *Vata 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. Amongst the five types of *Vayu*, *Udana* and *Prana* *vayu* are related with mind, *uthsaha* (enthusiasm), functioning of all *Indriya* (sense organs) etc. Thus vitiation of *Vata* leads to disruption of these functions. *Ashwagandhadhya 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.^[11]

Hence, *Ashwagandhadhya ghrita* acts not only as learning and memory enhancer (nootropic) but also may ameliorate diseases like Alzheimer's, Parkinson's etc. neurodegenerative diseases occurring generally in old age.

CONCLUSION

Thus, as hypothesized *Ashwagandhadhya ghrita* produced learning and memory i.e. nootropic effect in animal experimentation. (in Swiss albino mice). Due to presence of Withanone, Withanoside IV, linolenic acid, EPA and DHA this *ghrita* may also be useful in neurodegenerative diseases like Alzheimer's, Parkinson's etc.

So, in light of the above *Ashwagandhadhya ghrita* may prove to be a very useful formulation in Geriatrics in conditions like demntia and neurodegenerative diseases. Further research needs to be taken up for benefitting the full potential of this formulation.

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