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Review Article

THE ROLE OF *GO GHRITA* IN EPILEPSY - A REVIEW

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ABSTRACT

Epilepsy, a chronic neurological condition, can potentially allow up to 70% of individuals to live seizure-free with appropriate diagnosis and treatment, but it also carries a threefold higher risk of premature death compared to the general population, underscoring its seriousness. Epilepsy is a chronic neurological condition characterized by recurrent seizures and disturbances in consciousness. It can be correlated with the Ayurvedic concept of *Apasmara*, which involves occasional unconsciousness accompanied by unpleasant symptoms such as vomiting froth and abnormal body postures. Ayurveda recognizes *Ghrita* (ghee), particularly *Go Ghrita* derived from cow's milk, as a versatile food and medicinal substance with therapeutic effects. *Go Ghrita* is highly regarded for its ability to balance *Vata* and *Pitta Doshas* and its lipophilic nature, allowing it to penetrate the blood-brain barrier for targeted delivery and increased bio-availability. *Go Ghrita's Rasayana* property suggests that long-term use may help reduce the recurrence of epilepsy. When medications are processed with *Ghrita*, it enhances their medicinal properties, making formulations utilizing *Go Ghrita* potentially more advantageous and efficacious for treating epilepsy.

INTRODUCTION

Epilepsy is a chronic non-communicable disease of the brain that attacks people of all ages. It is calculated that up to 70% of people living with epilepsy could live seizure-free with proper diagnosis and treatment. The risk of early death is three times higher in this case than for the general population. It affects around 50 million people worldwide, making it one of the most common neurological diseases[1]. Epilepsy is collectively termed as a group of chronic disorders characterized by recurrent seizures associated with disturbances of consciousness and a characteristic body movement or convulsion, and sometimes autonomic hyperactivity[2]. Epilepsy can be correlated to *Apasmara* based on the signs and symptoms. *Apasmara* is characterized by loss of memory[3].

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Apasmara is explained in Ayurveda classics as occasional unconsciousness associated with disgusting activities like vomiting of froth and abnormal postures of the body due to the perversion of memory, intellect, and other psychic faculties[4].

Ayurveda opines that *Ghrita* can be considered for food as well as medicinal use. In India, *Ghrita* is a part of the regular diet. One of the unique properties of *Ghrita* is its "*Samskarasya Anuvarthana*" property, which refers to its ability to carry the properties of herbs and other substances that are processed with it. That is why *Ghrita* is considered the best among *Sneha*[5]. In Ayurveda, *Ghrita* is considered a *Rasayana*[6] and it is used as *Anupana* for various disease conditions. Among the 8 types of *Ghrita*, *Go Ghrita* is often considered the highest quality *Ghrita*. *Go Ghrita* has *Madhura Rasa; Guru, Snigdha, Mridu Guna; Sita Virya* and *Madhura Vipaka*[7]. It alleviates the vitiated *Vata* and *Pitta*[8].

This review article is an attempt to analyze the importance of *Go Ghrita* in epilepsy.

Epilepsy

"An epileptic seizure is electro-physiologically characterized by abnormal transient and excessive electrical discharge of cerebral neurons and clinically characterized by paroxysmal episodes of excess motor, sensory, autonomic, or psychic functions with or without alteration in consciousness"[9].

Pathogenesis[10]

Epileptogenesis is the transformation of a normal neuronal network into a chronically hyperexcitable one. In genetic and idiopathic epilepsy, epileptogenesis is determined by developmentally regulated events. Other reasons could be structural changes in neuronal networks.

The CNS injury seems to trigger a gradual reduction in the seizure threshold within the affected area, leading to the eventual occurrence of a spontaneous seizure. A head injury can lead to a structural change in a very focal, confined region that causes hyperexcitability of neurons, leading to further structural changes that evolve over time until the focal lesion produces clinically evident seizures. These structural changes could be due to intrinsic, biochemical properties of cells within the network like chronic changes in glutamate or GABA receptor function.

Apasmara

The *Apasmara* term is derived from "*Apasmarati Poorva Vrittam Vismarati Anena Iti Apasmaraha''* which means it is a condition caused by the loss of memory[11]. Ayurvedic classics define it as "*Smriterapagama*"[12] or "*Smrityapaya*"[13] which means loss of memory or inability to recall past experiences. The loss of consciousness due to the disturbances in *Smriti*, *Buddhi,* and *Manas* with *Bibhatsa Chesta* is called *Apasmara*[14].

Pratyatmalakshana[12]

- *Smriterapagama* - Loss of memory
- *Tamapravesa* - Loss of consciousness
- *Bibhatsa Chesta* - Actions like *Phenodvamana*, *Anga Vikshepana*, *Danta Khadana*, etc.
- *Dhi Satva Samplava*

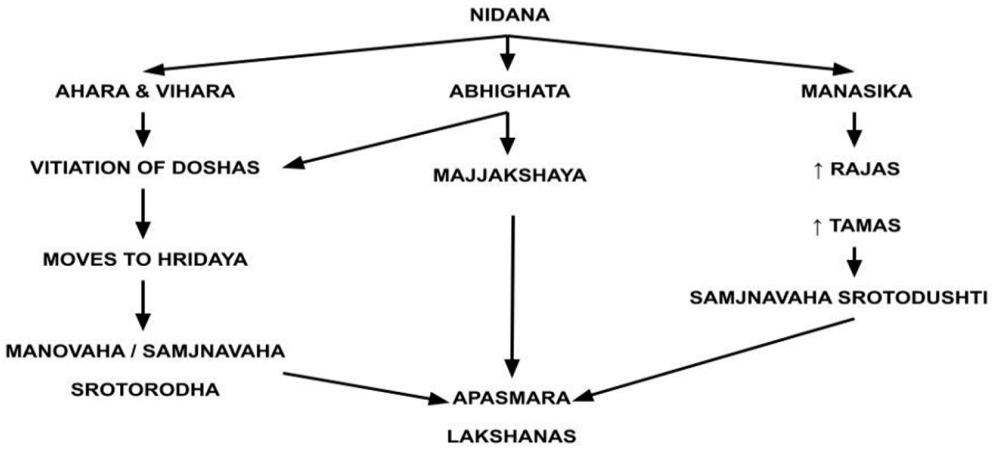
Samprapti

Charaka mentions the *Apasmara Samprapti* as,

The *Satva Guna* is suppressed by *Rajas* and *Tamas* and *Hridaya* becomes obstructed by the vitiated *Tridoshas* and *Mano Doshas* due to *Chinta*, *Kama*, *Bhaya*, etc. leading to the manifestation of *Apasmara*[15].

The *Nidanas* like improper *Ahara*, *Vihara*, *Marmaghata* to *Hridaya* and *Masthishka*, improper *Garbhini Charya*, etc. will lead to the vitiation of *Tridoshas* as well as *Mano Doshas.* These *Prakupita Doshas* move towards the *Sthana* of *Manas*, that is *Hridaya,* and are seated in *Hridaya* and obstruct the *Samnjavaha Srotas*, *Manovaha Srotas*, and *Indriyas*. This will lead to the improper functioning of *Hridaya* and afflicted with a stupor and malfunctioning of mental activities. Because of this the person visualizes things that do not exist, falls down, and gets convulsions. Then after sometimes the symptoms are relieved when the *Hridaya* is free from *Doshas*. But because of the existence of *Nidanas,* these *Doshas* may vitiate again and the disease will reoccur.

Figure 1: *Samprapti*



Chikitsa

Treatment to change the *Avarana* in *Hridaya, Srotas,* and *Manas* should be given first. *Shamana Aushada* for *Apasmara* should be used after clearing the *Avaranam*[16]. *Ghrita* has special importance in the treatment of *Apasmara*, as *Ghrita* is considered a *Rasayana*. Moreover, most of the drugs used to treat *Apasmara* are *Ghrita* preparations.

Majja Dhatu

According to Acharya Dalhana, *Masthulunga* is present in *Masthishka* which looks like ghee and it is

also called *Masthaka Majja*[17]. Acharya Susruta opines that *Majja Dhatu* is seen only in stout bones[18].

Karma

Majja has *Snehana* property which also provides strength to the body[19].

***Vridhi Lakshanas*[20,21]**

- *Gaurava* in *Netra*, *Anga* and *Rakta*.
- Swelling in joints.
- Appearance of small ulcers over the skin.

***Kshaya Lakshanas*[22,23,24]**

- Hollowness in bone
- Pain in bone
- Debility
- Giddiness
- Feeling of darkness in front of eyes
- Less quantity of semen
- Pain in joints
- Thinning of bone
- Weakness and lightness of bone
- Suffer from *Vatavyadhi* always

Role of *Majja Dhatu* in Epilepsy

The vitiation of *Doshas*, *Dhatus,* and *Srotas* has a role in the pathogenesis of a disease. By verifying the involvement of all the *Dhatus* in the manifestation of *Apasmara* with the symptoms of *Dhatu Vridhi* and *Kshaya* as well as *Srotovaigunya* it is understood that maximum similarities are present in the symptomatologies present in *Majja Dhatu Vaigunya*. The cardinal symptoms of *Apasmara* like *Tamapravesa*, *Bibhatsa Chesta*, etc. can be seen in *Majja Kshaya* and the *Masthaka Majja* can be considered as 'whole brain'.

***Doshas* Involved in Epilepsy[25]**

Udana Vata

Sthana- Uras and moves from *Nasa* to *Nabhi* through *Gala*

Prakruta Karma- Vak Pravritti, *Prayatna*, *Urja*, *Bala*, *Varna,* and *Smriti*.

Prana Vata

Sthana - Murdha and moves along *Uras* and *Kanda*

Prakruta Karma- Maintain the functioning of *Budhi*, *Hridaya*, *Indriya,* and *Chitta*. Other functions are *Shtivana*, *Kshavathu*, *Udgara*, *Nisvasa,* and *Annapravesa*.

Vyana Vata

Sthana - Hridaya and moves all over the body

Prakruta Karma - All motor functions such as *Mahajava*, *Gati*, *Avakshepa*, *Utkshepa*, *Nimesha*, *Unmesha*, etc.

Sadaka Pitta

Sthana - Hridaya

Prakruta Karma - Achieve the intended objects with *Budhi*, *Meda,* and *Abhimana*.

Properties of *Go Ghrita*[7]

Go Ghrita is clarified butter from cow's milk. It contains not less than 76 percent of milk fat by weight. It is oily liquid or semi-solid at room temperature, with a granular texture, white to light yellow in colour, odour rich and pleasant taste.

Synonyms – *Ajya, Havishya, Sarpi, Ghrita*

Properties

Rasa – *Madhura*

Guna – *Guru, Snigdha, Mridu*

Virya – *Sita*

Vipaka – *Madhura*

Karma – *Agnidipana, Anabhishyandi, Ayushya, Balya, cakshushya, Dipana, Hridya, Kantiprada, Medhya, Ojovardhaka, Rasayana, Ruchya, Sleshmavardhana, Snehana, Sukravardhaka, Tejobalakara, Tvachya, Vatapittaprasamana, Vayasthapana, Vishahara, Vrishya.*

Therapeutic Uses: *Agnidagdha, Amlapitta, Apasmara, Aruchi, Grahani, Jirna Jwara, Karnasula, Kshataksheena, Mada, Murcha, Sirasula, Smritinasa, Sosha, Unmada, Vishamajwara, Visarpa, Vishavikara, Yonisula.*

Table 1: Chemical composition of *Go Ghrita*[26]

Triglycerides	97.98%	Phospho-lipids	0.2 - 1.0%
Diglycerides	0.25- 1.5%	Sterols	0.22 - 0.4%
Mono-glycerides	0.16- 0.038%	Vitamin A	2500/100gms
Ketoacid glyceride	0.015 - 0.018 %	Vitamin D	8.5x10.7 gm/100gm
Glyceryl Esters	0.011 - 0.015%	Vitamin E	24x10.3 gm/100gm
Free fatty acid	0.1 - 0.44%	Vitamin K	1x10.4 gm/100gm

Table 2: Fatty Acids Percentage[26]

Butyric acid	4.5-6.0
Caproic acid	1.0-1.36
Caprylic acid	0.9-1.0
Capric acid	1.5-1.8
Lauric acid	6.0-7.0
Myristic acid	21.0-23.0
Palmitic acid	19.0-19.5
Stearic acid	11.0-11.5
Arachidic acid	0.5-0.8
Oleic acid	27.0-27.5
Linoleic acid	4.0-5.0

Ghee is a highly digestible food containing lower saturated fatty acids, making it beneficial for digestion. Ghee is rich in vitamins A, D, E, and K. Vitamins A and E act as antioxidants, protecting the body against oxidative damage. The lipophilic nature of ghee facilitates the transportation and delivery of ingredients within the cell, including mitochondria, microsomes, and the nuclear membrane. Ghee enhances its activity, absorption rate, and utility when combined with herbs. Overall, cow's ghee is a highly assimilable food, providing essential nutrients and critical antioxidants to protect the human body[26].

DISCUSSION

Action of *Go Ghrita* in Brain

All the activities of the body are controlled by the nervous system and the brain is included under the central nervous system (CNS) which is responsible for integrating, coordinating the sensory information, and ordering appropriate motor actions[27]. The brain is protected by a highly selective and complex structure called Blood Brain Barrier (BBB). It is a semi-permeable membranous barrier situated at the interface between the blood and cerebral tissue. The main function of BBB is to protect the CNS from potentially harmful substances which are coming from the bloodstream. It also provides the nutrients and energy necessary for its normal functioning[28].

The lipid-soluble nature of *Go Ghrita* helps in the transportation into the cell and its delivery to the mitochondrion, microsome, and nuclear membrane. *Ghrita* will be absorbed quickly and distributed in the target areas like the nervous system. The lipid-soluble drugs are able to be distributed quickly to intra and extracellular spaces. This BBB membrane separating the CNS tissue and circulating blood is considered lipophilic and it can selectively permit the passage of lipids and lipid-soluble drugs across it. So, the lipophilic nature of *Go Ghrita* is able to reach some of the most hard-to-reach areas like CNS.

Linoleic acid is present in *Go Ghrita* and crosses the blood-brain barrier at a rate comparable to other polyunsaturated fatty acids[29].

Action of *Go Ghrita* in Epilepsy

Ghrita is considered *Sreshta* for enhancing *Dhi*, *Dhriti*, *Smriti*, *Medha*, etc and *Apasmara* is included in the indication of *Ghrita*. Among the 8 types of *Ghrita*, *Go Ghrita* is considered the best. Considering the properties of *Go Ghrita* such as *Madhura Rasa*, *Guru*, *Snigdha Guna*, and *Madhura Vipaka*, this will help in the formation of excellent *Rasa Dhathu* and other *Dhatus*, especially *Majja Dhatu*.

Apasmara has a relapsing nature. When the *Doshas* go to *Leenavastha* the disease subsides and when the *Doshas* come to *Prakopavastha*, it envelops the *Hridaya*, and the disease returns. *Ghrita* corrects the *Agni* and this corrected *Agni* will create excellent *Rasadi Dhatus*. The *Rasayana* property of *Ghrita* can maintain this *Rasadi Dhatus*. This will help to eliminate the recurrence nature of the disease. The *Agni Dipana* property of *Go Ghrita* may also have a role in the cure of *Apasmara* caused by *Aharaja Nidana*.

Majja Dhatu has the *Snehana* property. In *Apasmara*, *Majja Kshaya* is happening. *Go Ghrita* can bring back the *Snehana* property of the *Majja Dhatu*.

The *Udana Vata* is responsible for *Vak Pravritti*, *Smriti*, etc. In *Apasmara*, *Smriterapagama* is one of the cardinal features. So, *Udana Vata* vitiation leads to *Apasmara*. When considering the *Prana Vata*, which is responsible for the normal functioning of *Bhudhi*, *Hridaya*, *Indriya*, and *Chitta*. It is also vitiated in *Apasmara* because *Dhi Satwa Samplava* is seen in *Apasmara*. Here vitiation in the *Dharana* of *Budhi*, *Indriya*, and *Chitta* occurs. *Vyana Vata* is responsible for all the movements of the body. When looking at the

Apasmara Lakshana, we can see *Bibatsa Cheshta*, which can be considered a *Vyana Vata Dushti*. *Sadaka Pitta* is the one which is *Hridgatam* and helps to attain *Buddhi* and *Meda*. Here in *Apasmara*, the *Dhi Samplava* occurs because of the *Sadaka Pitta Dushti*.

In the treatment of *Vata Dosha Prakopa*, *Sneha Prayogas* (oil or ghee-based therapies) are advised. When both *Vata* and *Pitta* are vitiated, the use of *Ghrita* can be more beneficial because it is a *Vata Pitta Hara Sneha*. In Ayurvedic treatment for *Pitta* imbalance, *Ghrita* is indeed a preferred choice. Therefore, *Ghrita* can be beneficial in managing conditions like *Apasmara*.

Tamapravesa is another cardinal feature of *Apasmara*. It can also be seen in *Majja Dhatu Kshaya*. The *Kapha* is the *Asrayasthana* of *Majja Dhatu*, so *Majja Kshaya* and *Kapha Kshaya* will happen simultaneously. In a *Kapha Kshayavastha*, the administration of *Go Ghrita* is beneficial which increases *Kapha* as well as *Majja*.

CONCLUSION

Go Ghrita can easily cross the blood-brain barrier and reach the target because of its lipophilic nature, thereby having more bio-availability. Also, the long-term use of *Go Ghrita* will help to reduce the recurrence of epilepsy due to its *Rasayana* property. Whenever we process any drugs with *Ghrita*, it has a unique ability to absorb the medicinal contents and properties. Therefore, if we prepare the formulations for epilepsy using *Go Ghrita*, it could be more beneficial and effective.

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