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RESEARCH ARTICLE

EFFECT OF *MAHATRIPHALADYA GHRITA SNEHAPANA* (INTERNAL OLEATION) IN THE MANAGEMENT OF DYSLIPIDEMIA (*MEDODUSHTI*)-A CASE REPORT

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Abstract

Dyslipidemia is a condition that can lead to various diseases in the future. There is a 1-2% increase in the incidence of coronary heart disease for every 1% increase in cholesterol levels. This condition is considered as a lifestyle metabolic disorder, primarily caused by poor dietary habits, lack of physical activity, and stress. Although *Ayurveda* does not have a direct reference to Dyslipidemia, its clinical characteristics and etiopathogenesis is imply that it can be classified under the broad categories of *Santarpanjanyavyadhi*, *Medopradoshaja Vikara*, *Medodushti*, and *Medosrotodusti*. The aim of this study was to treat Dyslipidemia using *Shamana Snehapana*. Lipid profile was selected as criteria for the assessment of Dyslipidemia. *Mahatriphaladya Ghrita* was chosen for *Shamana Snehapana* as its ingredients have hypolipidemic qualities. A 40 years old female patient reported in Panchakarma OPD with increase in serum cholesterol level, serum triglycerides level and serum LDL level. She was administered with *Mahatriphaladya Ghrita Snehapana* (internal oleation) for 14 days with a gap of 3 days after 7 days of *Snehapana* and shows significant improvement in Serum cholesterol level and LDL level. This improvement can be due to the correction of *Agni* by *Snehpana* and improved liver function. Therefore, this study concludes that *Shamana Snehapana* is safe and efficient for use in the treatment of Dyslipidemia.

INTRODUCTION

Lipoproteins carry lipids like cholesterol and triglycerides throughout the body after they are absorbed from the intestines. These lipids play crucial roles in energy production, steroid hormone synthesis, and bile acid formation. Triglycerides, high-density lipoprotein (HDL), low-density lipoprotein (LDL) cholesterol, and cholesterol are important elements in these processes. An disturbance in any of these elements, whether due to organic or non-organic factors, can result in Dyslipidemia.[i] Dyslipidemia results in irregular lipid levels in the blood stream, can raise the chance of heart-related illnesses.

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Dyslipidemia can be divided into two categories: primary and secondary. Primary dyslipidemia is inherited and occurs owing to genetic abnormalities that impair lipid metabolism.[ii] Acquired secondary dyslipidemia results from lifestyle decisions or other illnesses that affect lipid levels. The following are the most common forms ofdyslipidemia:

Elevations in low-density lipoprotein (LDL), which is also referred to as “bad” cholesterol, can cause artery blockages due to plaque accumulation.

High-density lipoprotein (HDL)known as "good" cholesterol, which helps prevent atherosclerosis by eliminating low-density lipoprotein (LDL) cholesterol from the blood stream.

When needed, extra triglycerides are stored in fat cells and used as fuel. But elevated triglyceride levels can cause inflammation and plaque accumulation in the arteries.

A high total cholesterol level is the result of having high levels of HDL, LDL, and half of the triglyceride. Higher total cholesterol level should be a sign of a higher risk of heart attack and stroke.[iii]

According to the ICMR INDIAB study, the prevalence of Dyslipidemia in the population is as follows:[iv]
13.9% had hypercholesterolemia (high total cholesterol levels).
29.5% had hypertriglyceridemia (high triglyceride levels).
72.3% had low levels of HDL cholesterol.
11.8% of them had elevated LDL cholesterol.

Dyslipidemia greatly heightens the risk factors for cardio vascular diseases (CVDs). CVDs are the foremost cause of death, leading to more fatalities each year than any other disease.

In India, the incidence of cardio vascular disease (CVD) has risen markedly in the last twenty years, now representing 24% of all deaths among adults aged 25 to 69.[v]

In *Ayurveda*, Dyslipidemia is categorized by various terms such as *Medodushti*, *Atisnigdhadhatu*, and *Dushitkleda*. According to the involvement of *Dosha* and *Dushya*, this condition is classified among *'Santarpana Janya Vikaras'*. Specifically, Dyslipidemia manifests as a form of *Kaphavikara*, possibly *Medodushti*, characterized as *Abaddha Meda*. According to *Acharya Chakrapani*, *Abaddha Meda* is described as"*Abbadhamiti asahatam*", indicating the *Poshaka* or *Asthayi Medo Dhatu*, which is inherently mobile and circulates throughout the body along with *Rasa-Rakta Dhatu*.

PATIENT INFORMATION

History of Present Illness-

A clinical case of 40 years old female patient who reported in Panchakarma OPD on 24 April, 2023 with chief complaints of increased serum cholesterol level, serum triglycerides level and serum LDL level since 2 months.

History of Past Illness-

Patient had no medical history of any major illness like diabetes/hypertension or thyroid dysfunction. No history of trauma/injury.
There was no relevant family or psycho-social history or any surgical intervention.

Drug History-

Patient have no relevant drug history.

Personal History-

The appetite, sleep, bowel, habits and urinary habits of the patient were normal and no addictions. The dietary pattern of the patient was vegetarian.

Clinical Findings

General findings- Vitals of the patient like BP, PR and temperature were in normal range. Built was normal and average height.

Systemic examination- No abnormality detected in any system.

DIAGNOSTIC ASSESSMENT

The National Cholesterol Education Program (NCEP), Adult Treatment Panel III (ATPIII) classification organizes lipid levels into the following categories:[vi]

- Total Cholesterol>200mg/dl
  or
- Triglycerides>150mg/dl
  or
- LDL>100mg/dl
  or
- HDL<40mg/dL (Male) and <50mg/dL (Female)

THERAPEUTIC INTERVENTION

Shamana Snehapana with *Mahatriphaladhya Ghrita* was administered in a dose of 20 ml daily once with lukewarm water in empty stomach at the time of breakfast for 14 days with a gap of 3 days after 7 days of *Snehapana*. The patient was advised to follow the prescribed procedure strictly along with do's and dont's which are as follows:

Procedure of Snehapana:

Purva karma-

Informed consent was taken. For *Shamana Snehapana*, no specific preparatory regimen is required. However, it is important to ensure that patients are in a balanced and healthy state (*niramavastha*) before administering *Shamana Snehapana*.

Pradhana karma-

The *Shamana Sneha* should be administered in '*annakala*' (at the time of food intake), in the '*prakanshita*' state (when there is urge of food intake) on a empty stomach in the morning.

The *Sneha* should be in *accha* form i.e only *sneha*. Food should not be taken until *Sneha* is digested.

Paschat Karma-

Three important aspects to consider in *paschat karma* are *Anupana*, *peyadi karma*, and *pathya-apathya*.

Anupana refers to a specific accompanying substance selected to be given along with the *Sneha dravya*. This selection aids in breaking down the substance, softening it, facilitating digestion, ensuring proper assimilation, and promoting immediate diffusion. Additionally, it energizes the patient and provides a sense of pleasure.

FOLLOW-UP AND OUTCOMES

Following *Snehapana*, daily observations were made to monitor *Sneha Jirna Lakshanas* (signs of proper digestion and metabolism of *Sneha*) which are *vataanulomana* (proper flatulence), *deeptagni* (increased appetite), *angalaghva* (lightness in body), *gatramardavata* (softness), *gatrasnigdhta* (smoothness of skin) and *purishsnigdhta* (softness of stools).

Follow up was done after 7 months of Post-*Snehapana*.

OBSERVATIONS

Table assessment before and after treatment and after follow up-

S.NO.	Parameter	Assessment		
		Before Treatment (23/04/2023)	**After Treatment (12/05/2023)**	**After 7 months Follow up (03/03/2024)**
1.	Serum Cholesterol	**225.0**	148.0	143.0
2.	Serum Triglycerides	**185.0**	88.0	117.5
3.	Serum LDL	**118.0**	70.4	82.7

4.	Serum HDL	70.0	23.0	36.8
5.	Serum VLDL	37.0	17.6	23.5

DISCUSSION

Dyslipidemia can be appropriately correlated to *Medodushti* especially *Abadddha Medodushti*. According to *Ayurveda*, all diseases arise from *Agnimandya*. This holds true for *Medodushti* as well. Therefore, the treatment for the disease should focus specifically on correcting the *Agni* state by using the *Shodhana* and *Shamana* especially acting on *Agnisthana* i.e. *Yakrut* (liver).

According to *Acharya Charak Ghrita* is described among the foods which should be taken regularly on daily basis (*Nitya Abhyas*) to maintain good health.[vii]

Also *Ghrita* is described as a *Rasayana* which provide longevity, prevention of disease with good physical and mental health.[viii]

Mode of action of *Snehapana* according to *Ayurveda*

1. **Pacification of Aggravated *Doshas* (*Vata*, *Pitta*, and *Kapha*)**
   Ghrita pacifies all three doshas.[ix] *Ghee* acts on the *Tridosha* by pacifying the aggravated *doshas* and restoring balance, particularly in conditions like *Medodushti*, it supports the body's metabolic processes, enhances digestion, and ensures proper distribution and utilization of nutrients.

2. **Improvement of Digestion and Metabolism (*Agni*)**
   Deepana and *Pachana-Ghee* enhances the digestive fire (*Agni*), improving digestion and metabolism. It facilitates the breakdown of *Ama* (toxins) and prevents its formation, which is crucial in *Medodhusti* where metabolic waste tends to accumulate.
   Metabolic Activation: It stimulates metabolic activities at the cellular level, improving the function of the liver and other organs involved in fat metabolism.

3. **Reduction of *Ama* (Toxins)**
   Detoxification: By promoting proper digestion and enhancing *Agni*, *Shamana Snehapana* helps in reducing *Ama*, which is often a contributing factor in *Medodhusti*. This detoxification process helps in restoring the normal function of *Meda Dhatu*.

4. **Nourishment and Lubrication**
   Dhatu Nourishment: *Ghee* nourishes the body tissues (*Dhatus*), including the *Meda Dhatu*, in a balanced manner. It provides essential fatty acids and nutrients that support healthy fat metabolism.
   Lubrication: It lubricates the body channels (*Srotas*), facilitating the smooth flow of bodily substances and preventing blockages that can contribute to metabolic disturbances.

Mode of action of *Snehapana* according to Modern Science

1. **Stimulates Bile Secretion**

Ghee is rich in healthy fats, particularly short-chain and medium-chain fatty acids, which can stimulate the liver to produce more bile. Increased bile production helps in the emulsification and digestion of dietary fats.

2. **Improves Bile Flow**

Consuming *ghee* can facilitate the more effective digestion and absorption of dietary fats and fat-soluble vitamins (A, D, E, and K) by enhancing the flow of bile from the liver to the small intestine.

3. **Enhances Bile Composition**

Ghee contains butyric acid, which is a short-chain fatty acid that has anti-inflammatory properties. Butyric acid may help maintain the health of the bile ducts and improve the composition of bile, making it more effective in fat digestion.

4. **Supports Liver Function**

The presence of antioxidants like vitamin E in *ghee* supports liver health. A healthy liver is essential for optimal bile production and secretion. Antioxidants play a crucial role in safe guarding liver cells against oxidative stress and subsequent damage.

5. Reduces Cholesterol Levels

Regular consumption of *ghee* in moderate amounts has been shown to have a neutral or even beneficial effect on blood lipid profiles. A balanced cholesterol level can prevent the formation of gallstones, which can obstruct bile flow.

6. Promotes Fat Metabolism

The healthy fats in *ghee* promote the metabolism of fats in the liver, which can enhance the production of bile acids, a primary component of bile.

5. Enhanced Fat Metabolism

Lipid Modulation: *Ghee* modulates lipid metabolism, helping in the proper utilization and breakdown of fats. This action helps in reducing excess fat and preventing its abnormal accumulation.
Cholesterol Regulation: It may help in regulating cholesterol levels, improving the lipid profile, and preventing conditions like atherosclerosis.

6. Anti-inflammatory and Antioxidant Effects

Anti-inflammatory Properties: *Ghee* contains butyric acid and other anti-inflammatory components that reduce inflammation in tissues and organs involved in fat metabolism.
Antioxidant Action: The antioxidants present in medicated *ghee* protect cells from oxidative stress, supporting overall metabolic health.

Some clinical research shows Hypocholesterolemic effect of *Ghee*

Dairy products have the potential to lower cholesterol levels by inhibiting the synthesis of cholesterol and increasing the excretion of bile acids and sterols through feces. Studies using rabbits have demonstrated that *ghee*, which includes conjugated linoleic acid (CLA), lowers serum LDL levels and slows the development of atherosclerosis. In order to learn more about *ghee's* ability to decrease cholesterol, researchers fed meals containing 2.5% or 5% *ghee* in both its natural and oxidized forms to Wistar rats. The findings showed that blood lipid profiles were altered by eating upto10% *ghee* without raising the risk factors for cardio vascular disease.[x]

Extensive research has extensively demonstrated the beneficial properties of *ghee* and *ghee*-infused herbal mixtures. Studies on animals have shown that *ghee* reduces serum levels of triglycerides, LDL, VLDL, and total cholesterol in a dose-dependent manner. Furthermore, liver homogenates of Wistar outbred rats showed decreased levels of nonenzymatic lipid peroxidation, total cholesterol, triglycerides, and cholesterol esters. The results with heated (oxidized) *ghee* were similar. Serum lipid levels of arachidonic acid significantly decreased and oleic acid significantly increased when *ghee* was the only fat source at a 10%concentration.[xi]

HMG CoA reductase activity in liver microsomes did not change in rats given diets supplemented with *ghee*, but there was a notable increase in cholesterol excretion through bile.[xii]

Research conducted among a rural population in India demonstrated that men who consumed greater quantities of *Ghee* exhibited notably reduced prevalence of coronary heart disease.[xiii]

Hypolipidemic effect of *Triphala*

One study using rats fed an atherogenic diet for 48 days found that *Triphala* was effective in lowering total cholesterol, low-density lipoprotein (LDL), very low-density lipoprotein (VLDL), and free fatty acid levels. Another study using rats on a similar diet found that *Haritaki*, one of *Triphala's* constituents, had hypolipidemic effects. This treatment resulted in lowering levels of total cholesterol, triglycerides, and total protein levels while increasing levels of high-density lipoprotein (HDL) cholesterol.[xiv]

Probable mode of action of *Mahatriphaladya Ghrita Snehapana*

Mahatriphaladhya Ghrita is an *Ayurvedic* formulation used for various therapeutic purposes, including the management of Dyslipidemia. The mode of action of *Mahatriphaladhya Ghrita* in treating Dyslipidemia can be understood through several mechanisms based on its ingredients and their effects:

1. Antioxidant Properties
The formulation contains *Triphala*, acombination of three fruits (*Amalaki*, *Bibhitaki*, and *Haritaki*), which are rich in antioxidants. These antioxidants assist in decreasing oxidative stress, a major factor in the development of atherosclerosis and Dyslipidemia.

2.Anti-inflammatory Effects
Many components of *Mahatriphaladhya Ghrita* have anti-inflammatory properties. Chronic inflammation is a known contributor to Dyslipidemia and cardiovascular diseases. By reducing inflammation, the formulation helps in maintaining healthier lipid levels.

3. Digestive Health Improvement
Ayurvedic principles emphasize the importance of digestion in overall health. *Mahatriphaladhya Ghrita* improves digestive health, enhancing the body's ability to process and eliminate excess fats and lipids. Improved digestion and metabolism can lead to better lipid profiles.

4. Herbal Synergy
The formulation includes multiple herbs that work synergistically to improve lipid levels. For example, *Amalaki* is known for its lipid-lowering effects, while *Haritaki* and *Bibhitaki* help in detoxification and improving liver function, which is crucial in lipid metabolism.

5.Liver Function Enhancement
The liver plays a key role in regulating lipid levels in the blood. *Mahatriphaladhya Ghrita* supports liver function, enhancing its ability to metabolize and excrete excess lipids, there by reducing overall blood lipid levels.

CONCLUSION

Dyslipidemia is characterized by abnormally high levels of one or more lipids and/or lipoproteins in the blood. The body contains various lipid-rich tissues, including *Vasa*, *Meda*, and *Majja Dhatu*. Among these, disrupted *Medo Dhatu* is particularly significant in the development of various metabolic disorders. *Agni*, responsible for all metabolic processes in the body, plays a crucial role. The condition known as *Medodhatwagni Mandya* leads to an excess of *Poshaka Medo Dhatu* in circulation, which can be linked to disorders like Dyslipidemia.

Shamana Snehapana in *Medo Dhusti* works through multiple mechanisms including *dosha* balancing, enhancing digestion and metabolism, detoxification, nourishing body tissues, improving fat metabolism, and providing anti-inflammatory and antioxidant benefits. This holistic approach not only addresses the root cause of metabolic imbalances but also promotes overall health and well-being. *Mahatriphaladhya Ghrita* exerts its therapeutic effects in Dyslipidemia through a multifaceted approach involving antioxidant activity, regulation of lipid metabolism, anti-inflammatory effects, improved digestion, and enhanced liver function. This holistic approach aligns with *Ayurvedic* principles and provides a natural means of managing Dyslipidemia. Further Randomized Controlled Trials are strongly recommended to establish the *Ayurvedic* principle of *Snehapana* in Dyslipidemia.

According to *Ayurveda*, it is suggested that *ghee* should be a part of the daily diet. This case report demonstrates that *ghee* helps improve lipid parameters and should be incorporated into the daily routine. Additionally, *ghee* can be consumed daily without any health concerns.

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