



INSIGHT OF HYPERLIPIDAEMIA IN TERMS OF AYURVEDA AND SOME MODERN CONCEPTS

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Abstract

A frequent lifestyle illness characterized by an increase in one or more plasma lipids such as triglycerides, cholesterol, cholesterol esters, phospholipids, and plasma lipoproteins is hyperlipidaemia. Hyperlipidaemia is currently a major public health concern. It is one such dietary condition that has been linked to a variety of ailments, including cardiovascular disease, metabolic syndrome, and even hypertension. The potential of hyperlipidaemia to participate in the pathophysiology of atherosclerotic illnesses such as coronary heart disease, which dominates the morbidity and mortality picture. It is compatible with Santarpanjanya Vyadhi. Medodhatu takes the initiative in this Dhatupradoshaja Vikara. The aetiology of the condition is influenced by both Kapha Dosha and Ama. Because of the excessive absorption of causative substances, Kapha Dosha becomes worsened, and Annarasa remains Apakva and becomes Ama. The elevated lipids can be related to Sneha, Medo Dhatu, and Sama Rasa since their characteristics are equivalent. In Ayurveda, it is more closely related with Medodushti, which is only a precursor stage of Medoroga that is easily reversible with an effective Ayurvedic regimen. Given the importance of Agni and Ama in the pathophysiology of hyperlipidemia, drugs containing Dipana, Pachana, Ama Nasahak, Kaphamedohara, Srotoshodhak, and Rasayan characteristics will be particularly effective in the treatment of hyperlipidaemia.

Key-words: Hyperlipidaemia; Medoroga, Medovaha Srotodusti Vikara, Cholesterol, Lipids

Introduction

The two main lipids present in blood are cholesterol and triglycerides. Lipoproteins are lipid transporters that move lipids from the peripheral organs to the liver. Cholesterol is present in all animal cell membranes and is the building block for steroid hormones and bile acids. Triglycerides are essential in the transfer of energy from meals to cells. In dyslipidaemia, higher lipids in the blood result from either an increased rate of synthesis or a decreased rate of lipoprotein breakdown. Hyperlipidaemia is characterized as an increase in one or more of the following lipids: cholesterol, cholesterol esters, phospholipids, or triglycerides. Abnormal plasma lipids can lead to coronary, cerebrovascular, and peripheral vascular artery problems. Hyperlipidaemia occurs when the concentration of cholesterol or triglyceride-carrying lipoproteins in the blood exceeds a normal level. The liver is to blame for elevated cholesterol levels in the circulation. The liver produces around 80% of the cholesterol in the body, with the remaining obtained from meals such as fish, eggs, and meat. [1-3]

High cholesterol levels induce a buildup of lipids (mainly in the form of esterified cholesterol) in the arterial walls, which causes atherosclerosis. Atherosclerosis affects various areas of the circulatory system in different ways, resulting in varying clinical symptoms depending on which circulatory bed is afflicted. One of the most major risk factors for cardiovascular disease is hyperlipidaemia (CVDs).

Cardiovascular diseases are anticipated to be the major cause of mortality and disability worldwide by 2025, accounting for one-third of all fatalities. Globally, 17.7 million people died from cardiovascular diseases (CVDs) in 2015. (31 percent of all global deaths). 7.4 million of these deaths were caused by coronary artery disease, whereas 6.7 million were caused by stroke. One of the risk factors for this illness is hyperlipidaemia. [4-6]

Accumulation of low-density lipoprotein in the intima, oxidation of low-density lipoprotein, absorption of oxidized low-density lipoprotein by macrophage scavenger receptors, effect of macrophages on foam cells, and plaque stability are all involved in the development of atherosclerotic plaque. Inflammatory cytokines are implicated in all stages of atherosclerosis, making it a chronic inflammatory disease. 3 When the obstruction of the

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coronary arteries exceeds 75%, angina symptoms generally occur gradually. Blood clots typically form on the uneven surfaces of arteries and can get dislodged, obstructing downstream blood flow. These blood clots are generally the cause of heart attacks and strokes. Furthermore, atherosclerotic blood arteries are often fragile and prone to rupture. Prevention is the greatest treatment for conditions like atherosclerosis. As a result, traditional medical therapies often focus on lifestyle modifications such as reducing saturated fat consumption, stopping smoking, and engaging in cardiovascular activity.

Drugs are also used to decrease cholesterol and blood pressure; however, the most of them have significant negative effects. Using alternative medicines, particularly medicinal plants and their supplements, to cure ailments such as hyperlipidaemia, diabetes, and cardiovascular disease, has risen in the majority of nations throughout the world in recent decades. One of the major issues that doctors and users of medicinal plants confront is a lack of information in the field of medication safety and its influence on disease.

Although Dyslipidemia cannot be clearly related to any clinical states mentioned in Ayurvedic classics, Acharya Chakrapani's concept of Abaddha Meda is comparable to the disease reported in recent studies. It has been linked to Rasagata sneha vridhhi, Raktagata sneha vridhhi, and Rasaraktagata sneha vridhhi by many Ayurvedic academics. It is associated with Medo dushti. The elevated lipids can be related to Sneha, Medodhatu, and Samarasa due to their similar properties. Hyperlipidaemia is associated to Asthayi Medo Dhatu Vridhhi, which is Ama in nature and is kept in the body for an extended length of time, causing further problems. It is probable that the condition is associated with Kapha Karaka Nidana, i.e., Santarpana Ahara, Vihara, which includes sedentary living, a high-calorie diet, a lack of exercise, and other factors that lead to Kapha Dosha and Medo Dhatu morbidity. As a result of Medodhatvagnimandya and Dushti, there is an unnatural accumulation of Kapha and Meda in numerous Srotas throughout the body. The presence of Aparipakva Kapha - Meda in the Rasa- Raktavaha Srotas obstructs the movement of Vata and Rakta via the affected channels, resulting in sickness manifestation depending on where the infirmity is located. [7,8]

In the allopathic medical system, we have a large range of medicines that are highly successful in normalizing cholesterol levels, but they also have side effects such as headache, nausea, intestinal trouble, rashes, sleep disturbances, Myalgia, and an elevation in serum transaminase, which can lead to liver damage.

Hyperlipidaemia according to Ayurveda

In Ayurveda various attempts have been made to use distinctive nomenclature to denote the word hyperlipidaemias which are as follows

- Rasagata Sneha Vriddhi
- Rasa Raktagata Sneha Vriddhi
- Medovriddhi
- Medoroga or Medodosha
- Ama Medo Dhatu.

Hyperlipidaemia occurs due to

- ❖ Agnimandya
- ❖ Ama utpatti
- ❖ Medoroga

Nidana (Etiology)^[9--14]

❖ Aharaaja Nidana (Dietary Factors)

Excess carbohydrates in meals can easily be converted to fats. Carbohydrate-derived fats have a greater melting point and are more saturated. Excessive consumption of protein-rich foods, such as milk and milk products, can elevate lipid levels in the body. When dietary protein intake exceeds tissue use, it is converted to triglycerides and stored in the body. Guru (heavy), Madhura (sweet), Sheeta (cool), Snigdha (oily), Shleshmala (Kapha stimulating), Atipicchila (excessively sticky), and Abhishyandi are the properties of Dravyas with Prithvi and Apya Mahabhuta dominance. Medovaha Srotodushti Vikara in the Medadhatu is caused by Avyayama, Divaswapna, and excessive consumption of Guru Ahara and Varuni, culminating in Khavaigunya.

❖ **Viharaja Nidana**

Avyayama (no exercise), Avyavaya (no sexual commerce), Divaswapna (daytime napping), Asanasukha (excess sitting), Swapnasukha (excess sleeping), Bhojanottara Snana (bath after meal), Bhojanottara Nidra (sleep after meal), and other factors contribute to Kapha aggravation. As a result, one of the etiopathologies of Medoroga is Kapha aggravation and the development of Meda. Sthaulya is induced by an increase in Sneha Guna in the body, which causes an increase in Kapha Dosha and leads to Meda Vriddhi. Sthaulya is caused by Taila Abhyanga, Snigdha Udavartana, and Madhura Snigdha Basti, all of which increase Sneha Guna in the body.

- ❖ **Manasika Nidana** - Some of the psychological traits stated in Ayurvedic teachings are Harshanityatva (joy), Achintanam (no tension), Priyadarshanam (seeing only likings), and Saukhyam (pleasure). These are Kapha aggravating factors that aggravate Meda.
- ❖ **Adrishtavastha (Beejadoshaja Nidana)** - This is caused by defects in the Shukra or Shonita, or both, which are passed down through generations. All Acharya have discovered genetic anomalies as a cause of Meda Roga and associated ailments such as Prameha. According to Acharya Charaka, one of the etiological components of Atisthauhya is beejadosha (defective gene).
- ❖ **Avaranajanya Nidana** - Vata Vikara or Vata diseases, according to Acharya Dalhana, are produced by Medadhatu's Avarana (covering) of the Marga. This refers to secondary illnesses caused by Vata, such as Madhumeha (diabetes mellitus), Dhatwagnimandhya (hypothyroidism), Medovaha Srotodusti Vikara (hyperlipidaemia), and so on.

Rupa (Clinical manifestations) ^[15-16]

- According to Acharya Charaka, the body is deformed by buttocks, abdomen, and breast and the individual is less enthusiastic about his physical exercise.
- Patients are more likely to develop xanthelasma, which are cholesterol deposits beneath the skin, particularly on or around the eyelids.

- Patients with high triglyceride levels may develop many pimple-like lesions across their bodies; eruptive xanthomas over the trunk, back, elbows, buttocks, knees, hands, and feet.

Samprapti (Pathogenesis)

According to Acharya Charaka, Ahara is the main pathogenic factor for Medavridhhi or Medadushti in Medoroga, whereas Amadosha is the key pathogenic factor for Medavridhhi or Medadushti in Medoroga, according to Acharya Sushruta. According to Acharya Charaka, the Koshtagata Vata becomes ensnared in the alimentary canal due to vitiated Meda (due to overindulgence in causative factors) and prompts the Jatharagni, which rapidly digests the ingested food items, which are then quickly absorbed by the aggravated Vata. As a result, the obese individual has a strong desire to eat, which leads to Medovaha Srotodusti. According to Acharya Sushruta, when Kapha Dosha is worsened due to etiological factors, food remains uncooked and sweeter, and this Rasa Dhatu moving throughout the body produces Meda.

According to the Sushruta Samhita, if a person regularly takes Shleshmala Aahara (Madhura, Guru, Sheeta, Snigdha) without sufficient physical activity and instead sleeps for an extended period of time, his Annarasa would remain Apakva and become Ama. This Ama possesses the properties of Madhura and Atisnigdha, and because to its affinity for Meda, it is made available for transformation into Sneha (Meda). Because the bigger Meda becomes deposited in numerous micro channels, obstructs them, and produces obesity if deposited in adipose tissue, such Amarasa does not provide nutrients to other Dhatus. [17,18]

Because of the excessive Madhura of Anna rasa during Avasthapaka, Madhura and Snigha ahara, Adhyashana, and Divaswapna cause Kapha vruddhi, namely the Snaihika guna of Kapha and the formation of Amarasa. The Rasa dhatu's Snaihika guna rises as a result of the Ashrayaashrayi bhava between Kapha and Rasa, and Ama is produced. The Rasa Dhatwagni will be unable to digest this Ama, resulting in an increase in Malarupi Kapha production. Hyperlipidemia occurs when the expanded Snaihika guna of Rasa Dhathu and Malarupi Kapha penetrates the Rasavaha Srothas. Dhamani Prathichaya will develop if not treated appropriately and immediately. It has the potential to impact other Dhatus, manifesting as

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Hridroga, Vatavyadhi, Prameha, and so on. Krusha people have hyperlipidemia as well. This is due to Vata vruddhi, which is induced by Nidanas such as Chinta, Krodha, and Udvega. Vata vruddhi develops as a result of these Nidanas, which leads to Vishamagni, which leads to Aprakrutha Rasa Utpathi and Malarupi Kaphavruddhi, and the condition proceeds to hyperlipidemia. [19]

Samprapti Ghatakas

Dosha	Kapha pradhana tridosha
Dushya	Jatharagni, Rasa, Rakta, Meda dhatvagn i
Ama	Tajjanya Ama
Srotas	Rasa, Rakta and Medovaha
Udbhava Sthana	Amashya
Rogamarga	Bahya or Abhyantra
Vyaktasthana	Sarvashareera (Sthoulya), Basti (Prameha), Hridaya (Hridroga), Mastiskhya (Pakshaghata)

Ayurvedic Chikitsa (Management)

According to Ayurveda, the general principle of management of any disorder is divided into three parts:

Nidana Parivarjana

Avoid Aharatmaka, Viharatmaka, Manasa, and other Nidana that are involved in disease causation. Medavahasrotas, Medavriddhikara Ahara, and Vihara should all be avoided if they are provocative and vitiating. [20,21]

Samshodhana (Bio cleansing therapies)

Panchkarma procedures may be utilized to detoxify the body. The combination of Lekhana basti with Vaca and Manjistha has been shown to be effective in the treatment of dyslipidemia. Bahya Shodhana has been reported to have Udvartana, as well as properties

such as Kaphahara, Meda Pravilayana, Sthirikaranam Anganam, and so on. 15 It helps to remove foetal odor, lowers excessive sweating, and soothes aggravated Dosha. In his Abhyantara Samshodhana, Acharya Charaka cites Vamana, Virechana, and Raktamokshana for Santarpanottha Vikara, which can be used to treat hyperlipidemia. He also suggests Rukshya, Tikshna, and Ushna Basti for Sthaulya management, which can aid in the treatment of hyperlipidemia. [20—22]

Samshamana (Drug Therapy)

A number of herbal and herbo-mineral medicines are in use to strengthen the cardiovascular system, act as cleansing agents for the microcirculatory channels (srotovisodhaka), and aid in cholesterol metabolism. All seven Langhana procedures, according to Rogi-Roga Bala, can be employed on a hyperlipidaemic patient. Acharya Sushruta treats Kustha, Prameha, Sthaulya, and Shotha in the same way.

Samshamana Karma reduces Vata, Pitta, and Kapha, as well as Medadhatu depletion, by boosting Meda Dhatvagni. Administering drugs with Guru and Lekhana properties that treat Meda, Kapha, and Vata, such as Madhu, which has Guru and Ruksha properties and is the best Medavridhhi drug. Acharya Sushruta advocated Dravyas such as Shilajatu, Guggulu, Gomutra, Triphala, Madhu, and Lekhana Basti. In answer, Acharya Dalhana stated that Virukshana aids in the reduction of Meda, but Chhedaniya drugs such as Shilajit, Guggulu, Loharaja, Triphala, and others aid in the removal of blockages from the Srotas, particularly the Medavaha Srotas. [20-22]

Aushadhi (Medicine) [23-24]

- Lekhaniya mahakashaya,
- Mustaka,
- Kushtha,
- Haridra,
- Vacha, etc.

Combined Drugs [25-28]

- Vati - Arogyavardhini Vati, Kutaki vati, Bhedani vati.

- Churna - Triphala Churna, Vacha Churna, Trikatu Churna, etc.
- Kwatha - Mustadi Kwath, Agnimantha Kwath, Brihat Panchmool Kwath.
- Taila Yoga - Triphaladya Taila, Maha Saugandhi Taila.
- Lauha Yoga - Vidangadi Lauha, Lauha Bhasma
- Rasayana - Shilajeet Rasayana, Guggulu Rasayana, Lauha Rasayana.
- Lepa- Dargandhyahar Lepa, Medohara Lepa, Vasadi Lepa, Haritaki Pralepa.

Ayurvedic lifestyle

Walking, swimming, running, or rowing aerobic exercise, stationary cycling/bicycling. Yoga Asana like Suryanamskar, pawanmuktaasan, utthanpadaasan, naukasan, bicycling.^[29]Pranayam (Breathing exercise and meditation) and Viharaja pathya (Shrama, Vyayama, Ushnodaka Sevan, Prajagaran, Bhramana, Rohan, Upavasa) etc. should be followed. Viharaja Apathya such as Sheetal Jala Sevana, Diwaswapna, Avyavaya, Avyayama, Ati Ashana Sukha Shaiya etc.^[30,31]

Ayurvedic diet^[30,31]

One should consume food of bitter, astringent taste, dry, Vegetables like carrot, cabbage, cauliflower, Pulses, lemon water with honey, whole grains, whole oats.

Discussion ^[20-25, 32,33]

Hyperlipidemia is a condition characterized by excessive or insufficient lipoprotein production. Hyperlipidemia is defined by high total cholesterol, LDL cholesterol, and triglyceride levels, as well as a decrease in HDL cholesterol levels throughout the body. It may be indicated in the blood by an increase in total cholesterol (Bad Low-Density Lipoprotein (LDL) cholesterol) and/or a rise in triglyceride concentrations and a reduction in good high density Lipoprotein (HDL) cholesterol concentration. It is usually considered as a key risk factor for coronary heart disease (CHD); for every 1% increase in cholesterol levels, the incidence of CHD rises by 1-2%. Hyperlipidemia is defined as an increased level of lipids and lipoproteins in the blood, which can be connected to cardiovascular disease. Hyperlipidemia is characterized as an elevated amount of lipids and lipoproteins in

the blood, which can be linked to an increase in Medas in the body and is linked to Medo Roga in Ayurveda.

There is no clear reference to a particular disease entity that is directly linked to hyperlipidemia. Various Ayurvedic academics have attempted to link it clinically as Rasagat, Raktagat, or Rasaraktagat Sneha vriddhi, Medoroga, Medo Vriddhi, Ama Medo Dhatu, Sthaulya, and so on. Because Agni is responsible for all metabolic activities in the body, an Ayurvedic treatment to Hyperlipidemia includes measures to improve Agni power and digest Ama. It is exclusively accountable for any change in Dosha, Dhatu, or Mala. When Agni is reduced, Ama is generated, which is potential of clogging metabolic pathways and causing illnesses. The primary therapy for high lipid levels is Agni correction.

The symptoms described by Acharya Charaka are an abnormal increase in fat and flesh that causes disfigurement, i.e., pendulous buttocks, abdomen, and breasts, a reduction in corresponding energy, making the person less enthusiastic in physical activities, Ayushohrasa (Diminution of lifespan), Javoparodha (Lack of enthusiasm), Kricchavyavaya (Difficulty in sexual activity), Daurbalya (Excessive thirst).

Conclusion

Most societies now recognize hyperlipidemia and its associated side effects as a medical condition. Furthermore, hyperlipidemia exacerbates metabolic abnormalities and raises the risk of cardiovascular disease, particularly in individuals with diabetes and high blood pressure. According to existing data, substances found in food supplements and medicinal plants such as dietary fibers, vitamins, flavonoids, sterols, and other antioxidants can help with lipid metabolism by affecting the metabolic processes of different tissues. Understanding and regulating the etiology of hyperlipidaemia is crucial due to its relation to multiple arterial illnesses such as coronary artery disease. It is expected that reducing cholesterol by 1% will reduce chronic heart disease by 2% to 3%. Hyperlipidemia is similar to Medovaha Srotodusti Vikara in terms of the underlying etiology, clinical features, and pathophysiology. The correct use of Nidana parivarjana, Ritucharya, and Dinacharya will help to maintain Agni and the balance of Doshas Dhatus and Malas, hence averting the beginning of sickness. Ayurveda can aid with not just cure but also prevention by halting

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the pathogenic process. More research is needed to confirm, examine, and implement these Ayurvedic ideas and treatments, which might be a boon to the globe in the future.

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