

Research

Hypercholesterolemia and Ayurvedic Medicine: A Case Report

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ABSTRACT

Background: Over the last two decades there has been an increasing emphasis placed on screening for high cholesterol and adopting interventions to reduce cholesterol levels in order to reduce the risk of heart disease. The high costs and side effects of hypercholesterolemia medications have led many people to search for alternate treatments. Only a few studies have been conducted to evaluate the effect of Ayurvedic herbal medicine formulae on hypercholesterolemia.

Objective: The objective of this article is to describe a case where Ayurvedic herbs appeared to have been helpful in the management of hypercholesterolemia.

Clinical Features: This patient was a 46-year-old woman who had been diagnosed with hypercholesterolemia two years prior to presentation. She had not responded to conventional treatment.

Intervention and Outcome: She was treated for eight months with the Ayurvedic formulae Kaishora Guggulu, Triphala and a custom made herbal tea mix. Her total cholesterol dropped from 270 to 208 mg/dl, her LDL dropped from 191 to 146 mg/dl, and her HDL rose from 57 to 63 mg/dl. There were no side effects reported.

Conclusions: This case demonstrates the use of Ayurvedic herbs in the management of hypercholesterolemia. Further high quality studies with randomized clinical trials should be conducted to better understand the effectiveness of Ayurvedic treatment for hypercholesterolemia.

Introduction

Cholesterol is a greasy substance that is a part of circulating lipids in the body. It is part of cell membranes and is used for the synthesis of steroid hormones, bile salts and vitamin D. It is both derived from the diet and synthesized within the body, mainly in the liver.¹

According to the American Heart Association, 98.6 million Americans aged 20 and older have total blood cholesterol levels above the optimal level of less than 200 milligrams per deciliter (mg/dl).² Hypercholesterolemia is one of the leading contributors to coronary heart disease, the number one cause of death of Americans.³ Globally hypercholesterolemia is estimated to cause 56% of ischemia heart diseases and about 4.4 million deaths per year.

Conventional treatment principles for hypercholesterolemia aim to reduce cholesterol biosynthesis, which will lead to lower blood levels. Most of the drugs (statins) available today are inhibitors of 3-hydroxy-3-methylglutarylcoenzyme A reductase, which is involved in cholesterol biosynthesis in the liver. Literature shows that the use of statins has a risk of chronic toxic effects including carcinogenic, teratogenic, and mutagenic changes over a lifetime of use.⁵ This has led to a search for more natural methods to control cholesterol levels.

Introduction to Ayurvedic Medicine

Ayurvedic medicine (also called Ayurveda) is one of the world's oldest medical systems. This 5,000 year old tradition is a holistic healing system that regards each individual as unique, and also takes into account the inherent relationship between the individual and the universe. Ayurvedic therapeutics is based on the "laws" of nature. Its holistic approach to health-care is based on a unique understanding of the interrelationship of body, mind and spirit. The aim of Ayurvedic medicine is to integrate and balance these elements to prevent illness and promote wellness through diet, nutrition, herbs, spices, yoga, external therapies, meditation, and daily and seasonal routines.⁶

The pathophysiology of Ayurvedic practice is based on three bio-energetic factors known as DOSHA. Of these, VATA (AIR) is responsible for causing psychosomatic mobility, PITTA (HEAT) is accountable for transformation and digestion and KAPHA (WATER) attends to structure and solidity. The DOSHA work through the body tissues (DHATU) and make them functional. Health is a state of balance of DOSHA in the body and their healthy interaction with AIR, HEAT and WATER in the surroundings in which an individual lives. Hence, substances in the nature are classified as Wind inclined, Heat inclined etc. Metabolic processes known as AGNI are vital for converting substances in nature into the body's components. All metabolic diseases are an outcome of improper AGNI, whereas in the balanced state of DOSHA, nourishment of the body tissues and timely elimination of wastes (MALA) is due to proper AGNI.

An individual's imbalance is understood by studying the history of illness along with extensive examination of the patient, including assessment of the three DOSHAs. When the three DOSHAs are balanced the body experiences health, but if there is a state of imbalance it will result in disease.⁷ Therapeutics for any disease are focused on bringing the DOSHAs back to constitutional equilibrium and rebalancing the AGNI of the patient that can provide metabolites that are essential for health of bodily tissues.

Concept of Cholesterol in Ayurveda

As stated earlier, Ayurveda emphasizes the importance of metabolic processes in health promotion as well as disease management. "AGNI", literally "fire", is the term used in Ayurveda for defining collectively all the bodily metabolic actions. Ayurveda classifies AGNI into several varieties: JAATARA AGNI – located in the alimentary tract and performing major metabolic processes, DHATU AGNI – situated at tissue levels and capable of processing metabolic requirements of individual tissues, and BHOOTA AGNI – subtle metabolic processes that happen at the cellular level.⁸

Metabolic processes maintain the normal quantity, quality and function of the DOSHA and DHATU. When in abnormal states due to various causative factors relating to body and the mind; metabolites that are not assimilated by the body tissues will be produced. The resultant product of such metabolic action is called AAMA.

AAMA is the primary cause of all metabolic disorders in Ayurveda. Once formed it is capable of obstructing the metabolic pathways and causing diseases. Cholesterol is considered as one such product that originates due to metabolic impairment in the alimentary tract and fat tissue (MEDA).

There is no precise term for hyperlipidemia in the Ayurvedic classics. Literature shows that scholars have tried to use distinct nomenclature for hyperlipidemia, e.g., Rasagata Sneha Vriddhi (increase in lipids in plasma), Rasa Raktagata Sneha Vriddhi (increase in the lipids in plasma and blood), Medovriddhi (generalized lipid increase), Medoroga or Medodosha (obesity), AAMA Medo Dhatu (abnormally formed adipose tissue). A detailed study of hyperlipidemia reveals its similarity to Asthayi Medo Dhatu Vriddhi (abnormal increase in circulating lipids) with regard to the pathophysiology. This excessively increased circulating lipid is AAMA in nature, resulting in further complications.⁴

Pathology According to Ayurveda

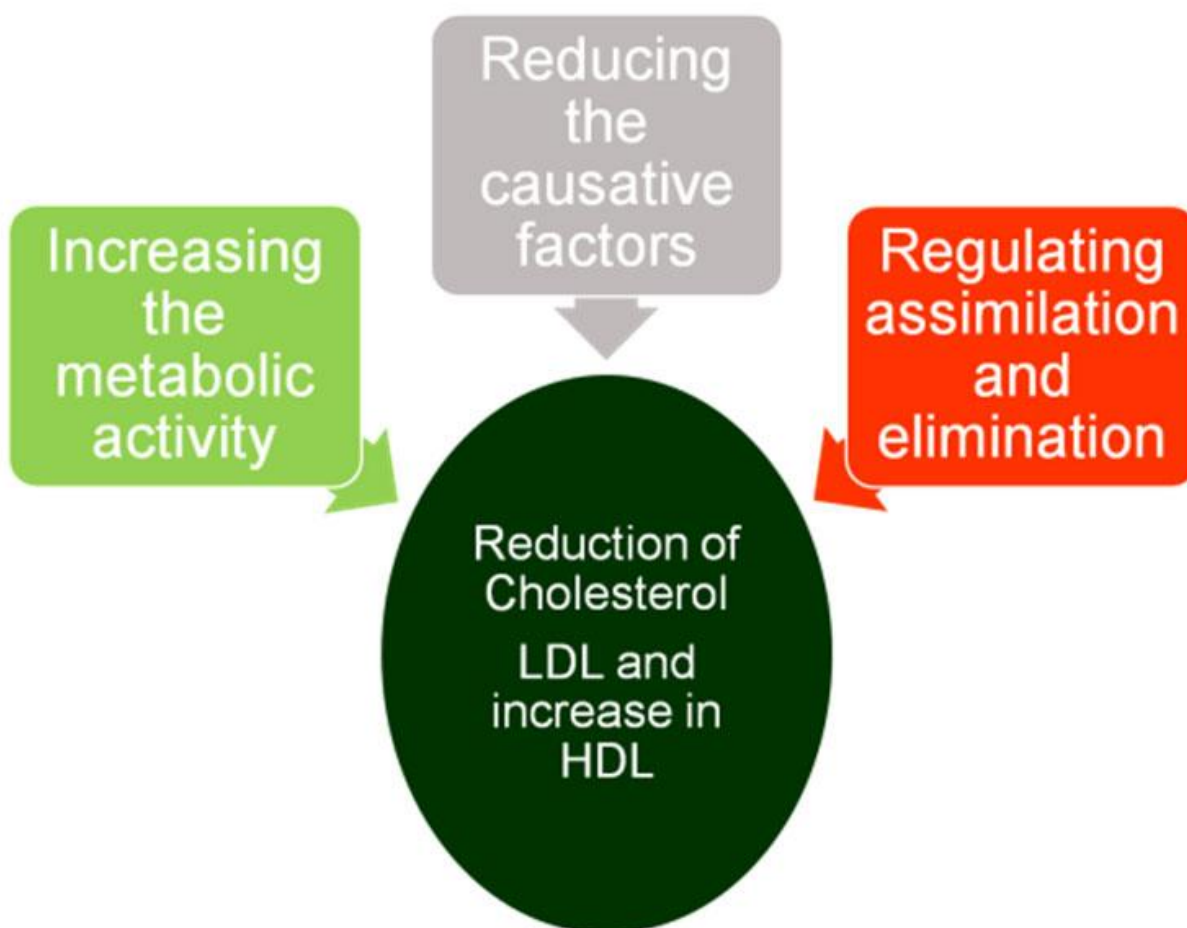
The abnormal MEDA (fats) formed due to an aberrant state of metabolism circulates in the channels of the body and gets deposited, producing various symptoms like flabbiness of the body parts such as abdomen, breasts, etc. It clogs and blocks the flow of lymph and blood, causing lethargy, difficulty breathing, excess sleep, excessive perspiration, a foul body odor, weakness, lack of stamina and loss of libido. Ultimately the excess of fats gradually

pathologically involve DOSHA and DHATU in the body and cause maladies such as hypercholesterolemia, hypertension, diabetes mellitus, heart problems, joint disorders and obesity.

Ayurvedic Treatment Principles for Managing Hypercholesterolemia

As shown in **Figure 1**, the Ayurvedic approach to hypercholesterolemia involves methods to increase the digestive fire to digest the AAMA, regulating assimilation and elimination and controlling the causative factors.⁸ Several individual herbs and combinations of herbs are used in Ayurveda for the management of Medo Dhatu Vriddhi (increased lipids), AAMA and metabolic disorder.⁹

Figure 1



The objective of this article is to describe a case where Ayurvedic herbs appeared to have been helpful in the management of hypercholesterolemia. A literature search did not reveal any previous studies using a similar Ayurvedic formulae for the treatment of hypercholesterolemia.

Case Presentation

The patient was a 46-year-old woman who had been diagnosed with hypercholesterolemia two years prior to the initiation of Ayurvedic treatment. At presentation her lipid profile level showed high total cholesterol (270 mg/dl), average HDL (57mg/dl) levels and high LDL (191 mg/dl) level. Her mother also suffered from hypercholesterolemia. The patient was under the supervision of her primary care physician and had been monitoring her diet and taking Lipitor for two years without any improvement. She complained that taking her medication was causing cramping in the calves.

At presentation she had symptoms of irregular bowel movements, lethargy, excessive sleep and distension of her abdomen. She was 5' 7" tall and weighed 144 lbs, indicating a Body Mass Index of 22.6, which is in the normal range. Ayurvedic examination revealed that the patient had weak digestive fire. A diagnosis of Asthayi Medo Dhatu Vriddhi was made.

Intervention and Outcomes

Ayurvedic treatment for this patient consisted solely of the use of herbal formulae over an eight-month period. Three preparations were initially prescribed for the first 4 months.

1. **Kaishora Guggulu:** This formula consists of the following ingredients:

- Haritaki Fruit (*Terminalia chebula*)
- Vibhitaki Fruit (*Terminalia belerica*)
- Amalaki Fruit (*Emblica officinalis*)
- Guduchi Stem (*Tinospora cordifolia*)
- Ginger Root (*Zingiber officinale*)
- Pippali Fruit (*Piper longum*)
- Black Pepper Fruit (*Piper nigrum*)
- Vidanga (*Embelia ribes*)
- Danti Root (*Baliospermum montanum*)
- Trivruth Root (*Operculina turpethum*)
- Guggulu Resin (*Commiphora mukul*)

The patient was prescribed four 300 mg tablets per day. Two tablets were taken after breakfast and two tablets after dinner.

2. **Triphala :** This formula consists of the following ingredients:

- Haritaki Fruit (*Terminalia chebula*)
- Vibhitaki Fruit (*Terminalia belerica*)
- Amalaki Fruit (*Emblica officinalis*)

The patient was prescribed three 300 mg tablets per day to be taken after dinner.

3. **Custom prepared Herbal Tea blend:** This formula consists of the following ingredients:

- Coriandrum sativum -1TBS
- Cuminum cyminum -1TBS
- Foeniculum vulgare- 1 TBS
- Curcuma longa -1/2 TBS
- Elettaria cardamomum -1/2TBS

The mix was added to 32 oz of hot water and prepared as a decoction. It was prepared in the morning and taken throughout the day.

After 4 months of treatment, the lipid profile was repeated. Her total cholesterol level was reduced from 270 mg/dl to 231mg/dl, HDL level was reduced from 57 mg/dl to 45mg/dl and LDL level was reduced from 191mg/dl to 163 mg/dl.

The patient was asked to continue the same treatment for another four months except for a change in dose of Kaishora Guggulu, which was reduced to 2 tablets a day (one tablet after breakfast and one tablet after dinner) due to the positive results that had been obtained.

After eight months of treatment the lipid profile test was obtained again. Total cholesterol value was reduced from 231 to 208 mg/dl, HDL level improved from 45 to 63 mg/dl and LDL level was reduced from 163 mg/dl to 146 mg /dl (**Table 1**).

Table 1. Patient's Lipid Profile Results

| | Total cholesterol | HDL | LDL |
|-------------|-------------------|-----|-----|
| Baseline | 270 | 57 | 191 |
| At 4 months | 231 | 45 | 163 |
| At 8 months | 208 | 63 | 146 |

Discussion

The patient in this case report showed a significant improvement in total cholesterol, LDL and HDL levels after eight months of Ayurvedic therapy with herbs after not receiving benefit from conventional medical care. No adverse effects were reported. She did not make any changes in her diet or lifestyle during the course of the treatment. This case lends support for using Ayurvedic treatments in the management of hypercholesterolemia.

Ayurvedic medicine theories are now being applied to biomedically defined clinical entities such

as hypercholesterolemia. These theories has been applied to conceptualize the etiology and pathogenesis of hypercholesterolemia, which includes abnormal digestive fire (especially weak), and AAMA.

The mode of action of the individual herbs used in this study for cholesterol reduction is not known definitively because their mechanism of action has not yet been elucidated by research. It is presumed that the benefit seen was due to the combined action of the ingredients that act on the different stages of cholesterol metabolism.¹⁰

The Kaishora Guggulu formula helps to maintain healthy metabolism and remove toxins from the body. It acts as good blood purifier. It stimulates the digestive fire and will help to digest the AAMA, which is the main factor to be addressed when we are dealing with hypercholesterolemia.¹⁰ One of its main ingredients is *Commiphora mukul*, a resin that inhibits the reabsorption of bile salts and acids, causing them to be excreted by the laxative action of *terminalia chebula*, another ingredient. Thus, this combination reduces the excessive cholesterol by increasing its catabolism.

Triphala tablets help to improve digestion and regulate elimination, leading to proper formation of body tissues. It is considered one of the best antioxidants and an effective blood purifier. It helps to improve the circulation and is a very effective formula for hypercholesterolemia.¹⁰

The prescribed herbal tea helps to improve the digestive fire and break down the undigested metabolites (AAMA) in the body. Some of the herbs in these combinations are anti-oxidant in nature, leading to the formation of optimal dhatus (body tissues), and thereby protect the body from imbalance due to vitiated DOSHAS.

Various studies show that a high level of cholesterol should be reduced to prevent the development of heart disease. There has been an increasing emphasis placed on screening for high cholesterol and adopting interventions to reduce cholesterol levels in order to reduce the risk of heart disease.¹¹ Conventional medical treatment for hypercholesterolemia does not work in some individuals and is often associated with side effects. Thus there is a need for alternative treatments. Ayurvedic medicine has been used for thousands of years for the treatment of various metabolic disorders. However, few studies have been conducted to evaluate the effectiveness of Ayurveda herbal medicine formulae on hypercholesterolemia. Higher quality studies, such as randomized clinical trials, are lacking.¹²

Limitations

With any single-subject study, we must consider other possible causes for the results besides the treatment intervention. Although the patient indicated that she did not change her diet or lifestyle or begin any other therapies for hypercholesterolemia during the course of Ayurvedic treatment, there is always the possibility that changes did occur. There may also have been other confounding life factors such as stressful events. A longer course of treatment within a more controlled trial may lead to more definitive conclusions.

Conclusions

Hypercholesterolemia can be explained through the principles of Ayurveda. This case illustrates how Ayurvedic herbs may be effective in the management of hypercholesterolemia. Further high quality studies with randomized clinical trials should be conducted to better understand the effectiveness of this treatment.

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