

Cholesterol and Chinese Medicine

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Abstract

Neither cholesterol nor hypercholesteremia exist as entities in traditional Chinese medicine. Nor, given that hypercholesteremia can be asymptomatic, is it necessarily easy to make a diagnosis and pattern differentiation. In order to understand hypercholesteremia better in terms of Chinese medicine, this article works forward from the known aetiology of hypercholesteremia and backwards from a. those disease processes that hypercholesteremia can precipitate, b. the nature of Chinese herbal substances that have been demonstrated to reduce cholesterol, and c. the actions and side-effects of Western medical drugs used to treat hypercholesteremia. Five major treatment strategies based on differentiation of patterns are offered along with herbal prescriptions and acupuncture.

The aim of this article is to examine hypercholesteremia from the perspective of Chinese medicine and to establish a suitable treatment strategy with herbal medicine and acupuncture.

Western medicine background

Roughly one quarter of cholesterol in the body comes from consumed food and the rest is created in the liver and other cells. Cholesterol is a vital component in the cell membrane, used for the formation of steroid hormones, vitamin D and bile acids, as well as for fat transfer into the blood. Cholesterol, like other fats in the blood, is not soluble. It is transported into the blood by lipoproteins of which there are two kinds: low density lipoprotein (LDL), also known as 'bad cholesterol', and high density lipoprotein (HDL), also known as 'good cholesterol'.

High levels of fats in the blood do not in general create signs and symptoms. At especially high levels, growths named xanthomas are created on tendons and skin. Very high levels of triglycerides may cause an enlargement of the liver and the spleen, and acute pancreatitis.

Hypercholesteremia has two causes:

- Primary (genetic): Self overproduction in the liver or defective clearance in cells.
- Secondary: Sedentary lifestyle with excessive dietary intake of saturated fat, cholesterol (from animal products) and trans fatty acids (commonly used in many processed foods), obesity, diabetes mellitus, alcohol abuse, chronic renal failure, hypothyroidism, ageing, menopause etc. Foods of vegetable origin do not contain cholesterol, but some of them contain trans-fats that can cause an intensified production of cholesterol by the body.

High levels of cholesterol in the blood increase the risk of peripheral and coronary atherosclerosis, leading to myocardial infarction, stroke or peripheral artery disease¹. However, not all types of cholesterol increase the risk for those diseases. LDL is thought to increase risk while HDL reduces it. Excess LDL can accumulate within the vessel walls, where it becomes oxidised and altered in other ways. The altered components then incite an inflammatory response that progressively and dangerously changes the arteries leading to the creation of atherosclerotic plaques². Ideally, LDL levels should be under 130mg/dl (3.36 mmol/L), while HDL should be over 40mg/dl (1.03 mmol/L)³. HDL levels should also be higher than 20% of total cholesterol. The total cholesterol level is less important as a cause of risk for heart disease and stroke⁴.

Chinese medicine

The Su Wen (Plain Questions 28) said: "Diabetes-like disease with internal heat, sudden fainting, hemiplegia, weakened and cold limbs, fullness of energy causing upward pressure, are the symptoms of rich people who are in the habit of consuming greasy and rich flavoured foods."⁵

It can be seen, therefore, that as early as the Su Wen we can find the first evidence of the damage that is today connected to cholesterol. The Su Wen speaks here of diseases linked to nutrition and not to cholesterol itself because Chinese medicine holds a qualitative approach rather than a quantitative one. Emphasis is put on the signs and symptoms that the patient presents, which are gathered to compose a clinical picture, from which a diagnosis and treatment are produced. Due to the fact that high levels of cholesterol in themselves do not produce any signs

		Herb name	Comments
Herbs with a Regulating Blood Effect	Cold nature	Dan Shen (<i>Salviae miltiorrhizae Radix</i>)	Appropriate mainly for conditions of heat in the blood and stasis ¹⁰
		Da Huang (<i>Rhei Radix et Rhizoma</i>)	Found in research to reduce the ratio of cholesterol and to have a haemostatic effect ¹¹
	Hot nature	Shan Zha (<i>Crataegi Fructus</i>)	Research shows that it lowers triglycerides and cholesterol, promotes vasodilatation, is anti-clotting, and improves circulation in the blood vessels ¹²
		San Qi (<i>Notoginseng Radix</i>)	
		Chuan Xiong (<i>Chuanxiong Rhizoma</i>)	
Clear Liver Heat	Treat dampness	Huang Lian (<i>Coptidis Rhizoma</i>)	
		Yin Chen Hao (<i>Artemisiae scopariae Herba</i>)	
		Ze Xie (<i>Alismatis Rhizoma</i>)	Research shows a reduction of cholesterol, triglyceride and an increase of HDL ¹³
		He Ye (<i>Nelumbinis Folium</i>)	
		Jue Ming Zi (<i>Cassiae Semen</i>)	Clears heat and fire from the Liver, penetrates the Kidneys and nourishes ¹⁴
Strengthening herbs	Warm herbs	Shu Di Huang (<i>Rehmanniae Radix preparata</i>)	Lowers blood pressure and serum cholesterol ¹⁵
		He Shou Wu (<i>Polygoni multiflori Radix</i>)	Found in research to lower cholesterol levels by diminishing its absorption in the small intestine; relieves arteriosclerosis and improves the microcirculation ¹⁶
		Hong Qu (<i>Red Yeast Rice</i>)	The yeasts contain Monascolin which inhibits HMG-CoA reductase, an enzyme that triggers cholesterol production.
	Cold herbs	Jiao Gu Lan (<i>Rhizoma seu Herba Gynostemmatis</i>)	Found to lower both total cholesterol and triglyceride levels ¹⁷

and symptoms, we might suggest that no diagnosis (or treatment) can be offered using Chinese medicine tools. We might even say that if an imaginary patient arrives, who has no complaints and does not show any signs and symptoms, with the pulse and tongue appearing normal (although laboratory tests may point to hypercholesteremia), according to Chinese medicine there is no tool that we can use to treat him, due to the inability to establish a diagnosis or differentiation.

Thus, it appears that diagnosing and treating cholesterol according to Chinese medicine has to be undertaken in two ways. The first approach would make a complete diagnosis of the patient and treat him according to any pattern/s diagnosed, without taking into account the cholesterol. This approach assumes that alongside the return of the patient to a balanced state, an improvement will also occur in the level of cholesterol. The second approach is to try and analyse the expected damage due to hypercholesteremia and the energetic nature of cholesterol, and to formulate a treatment suitable to these. This article deals with the second approach, taking the view that in the clinic there must be a combination of both systems.

This article will analyse the energetic nature of cholesterol from a number of different angles, and

will try to unite them to create a uniform picture of the best ways to diagnose and treat hypercholesteremia. First, the illnesses caused by hypercholesteremia will be examined, followed by an account of the nature of those Chinese herbs that have been found to be efficient empirically for the treatment of hypercholesteremia. In addition, the aetiology of hypercholesteremia will be examined, as well as those foods that are known to have a positive influence on high levels of cholesterol. Finally, an analysis of the Western drugs used in the treatment of cholesterol will be made.

It is important to emphasise that cholesterol is a part of normal body physiology and therefore is considered to be a part of zheng (upright) qi. Only when it is in excess does it become xie (pathogenic) qi.

Cholesterol and analysis of illnesses caused by cholesterol

As shown above, hypercholesteremia may lead to atherosclerosis with consequent risk of heart attack and stroke.

Heart attack (myocardial infarction/MI)

The pain and other symptoms of MI suggest a clinical picture of Heart blood stasis⁶. From this it can be

Table 1: Herbs that have been found empirically to treat cholesterol

concluded that a strategy of regulating blood and removing stasis can be undertaken so as to prevent the damage caused by hypercholesteremia. A part of regulating the blood is regulating qi, as it is said to be the commander of the blood⁷. Hence, an additional zang that is essential to refer to is the Liver, because of its function of maintaining free flow in the body. As it is said in Su Wen chapter 70:

“The moderate energy of wood prevails everywhere, causing the yang energy to relax, the yin energy to spread and the qi activities of the five elements to become unimpeded and moderate”⁸.

Brain damage

Another important consequence of hypercholesteremia is a significantly elevated risk of cerebrovascular accident (CVA) or transient ischaemic attack (TIA). This corresponds to ‘zhong feng’ (‘struck by wind’) in Chinese medicine. There are four possible mechanisms that can lead to ‘zhong feng’⁹:

- Yin deficiency and hyperactivity of yang leads to flaring up of Liver fire.
- Accumulation of phlegm dampness leads to obstruction of the channels.
- Excess Heart fire leads to sudden rise of Liver yang.
- Attack of exogenous wind stirs up Liver wind.

It can be seen that the Liver is the principal organ involved, along with heat and phlegm. Therefore the treatment strategy should calm the Liver, and clear heat and phlegm.

From analysing the illnesses we can summarise that hypercholesteremia mostly gives rise to Liver qi stagnation, Heart blood stasis, heat and phlegm.

Chinese herbal medicine

Another way to understand cholesterol is to examine those herbs that have been found empirically to treat cholesterol (see Table 1).

The energy of herbs that treat hypercholesteremia

1. Almost all of the herbs have an aspect of regulating the blood or clearing Liver heat.
2. Most of the herbs are bitter and therefore have a drying nature.
3. Some herbs strengthen the Liver and Kidney yin.

Aetiological factors

By analysing the factors leading to hypercholesteremia we can make some assumptions about the energy of cholesterol.

- a. Old age: Characterised by a tendency to Liver and Kidney yin deficiency.
- b. A fattening, fat-rich diet and/or a medium-to-high intake of alcohol cause dampness all over the body. Alcohol leads to dampness in the Liver and in the Gall

Bladder. Turbid damp phlegm is produced due to a chronic weakening of the middle warmer caused by an inadequate diet and an overload on the digestive system.

- c. Lack of physical activity: Physical activity can lower cholesterol levels and in doing so constitutes a method of treatment. Physical activity also helps regulate the Liver qi which in turn helps to transform phlegm.
- d. Hypothyroidism: Characterised by a low metabolism that causes obesity, tiredness, gloomy expression, hoarse voice, slow speaking, eyelid droop, swelling of the face, constipation, lack of tolerance to cold, thin and dry hair, confusion, forgetfulness and dementia, and a slow pulse¹⁸. It appears mostly in adults. These signs can be connected to Spleen qi deficiency, Kidney and Spleen yang deficiency, Liver qi stagnation with phlegm, and stasis of blood and phlegm¹⁹.
- e. Uncontrolled diabetes: Diabetes can be divided into Lung, Stomach and Kidney yin deficiency types; all may lead to damage of the original yin²⁰ and to the creation of deficiency heat.

From analysing the risk factors, we propose that the following disharmonies may cause hypercholesteremia:

- 1 Kidney and Liver yin deficiency.
- 2 Liver/Gall Bladder damp heat.
- 3 Liver qi stagnation.
- 4 Spleen and Kidney yang deficiency.

Food substances that lower cholesterol levels

Ku Ding Cha (*Camellia sinensis*) is a very bitter variety of tea. It is used to disperse wind-heat, clear the head and the eyes and resolve toxins, thus being used for common cold, rhinitis, itching eyes, red eyes and headache²¹. Modern research suggests that it promotes blood circulation, lowers blood pressure, and lowers blood lipids including cholesterol. It has the reputation of preventing deterioration of the heart and brain function and maintaining proper body weight. It can be concluded that Ku Ding Cha has cold energy, mainly enters the Liver and Stomach (also Spleen and Heart) channels, and has a very bitter and sweet taste. Its functions are to cool the Liver and regulate blood, dry hot phlegm and dampness and generate fluids. From this we can understand that the energy of cholesterol is hot and that it can lead to blood stasis²².

Drugs that lower cholesterol

Another way to look at the energetics of cholesterol is through examining those drugs that reduce it. Observing the side effects of these drugs and the extreme situations to which they can lead, can teach us about the energetic nature and direction they possess.

Cholesterol		
	Biao	Ben
Energy	Hot	Deficiency heat
Related organs	Liver, Gall bladder, Heart	Liver, Kidney, Spleen
Main pathologies	<ol style="list-style-type: none"> 1. Damp heat in the Liver and the Gall bladder 2. Stagnation of Liver qi and of Heart blood 3. Turbid phlegm obstruction in the channels 4. Heart blood stasis 	<ol style="list-style-type: none"> 1. Deficiency of Kidney and Liver yin leads to deficiency heat which makes the phlegm turn viscous and stick inside the channels and blood vessels 2. Weakness of the Spleen qi as a basic cause of phlegm and dampness 3. Weakness of the Kidney qi that leads to impairment of fluid metabolism and the creation of dampness.

The statins family

Statins block the body's synthesis of cholesterol, mainly in the liver. HMG-CoA reductase is a liver enzyme that supervises the production of cholesterol in the body. Statins, as HMG-CoA reductase inhibitors, produce significant decreases of the LDL levels, and some statins also have a positive influence on HDL levels and on triglycerides. The statins family have also been found to be effective in the treatment of inflammation; they stabilise the blood vessel walls and reduce the probability of blood coagulations and embolisms. They have also been found to reduce blood pressure. According to Chinese medicine, therefore, it is possible to say that drugs from the statins family can regulate the flow of qi and blood.

Common side effects of statins include pain and weakness of the muscles, lack of appetite and nausea, as well as disturbances in liver function. These signs and symptoms can be viewed as Spleen qi deficiency.

Less common side effects include fever and unexplained tiredness, headaches, insomnia and rash. These can be viewed as heat in the Liver, Liver yang rising and heat in the blood.

We can therefore summarise by suggesting that statins act on the Spleen and Liver organs and can lead to qi deficiency and heat.

Summarising the energetic nature of hypercholesteremia

In view of the above, it is possible to summarise the factors contributing to hypercholesteremia from the perspective of ben (root) and biao (branch) as follows (See Table 2).

Treatment of cholesterol by Chinese herbs and acupuncture

The main principles are:

1. Regulating qi and blood, removing stasis

This combination is most suitable for patients with prolonged and chronic illness, problems in the coronary blood vessels, high blood pressure, chest pain, asthma, numbness, purple tongue and choppy pulse. Care should be taken with patients who take blood thinners, and blood tests for coagulation levels should be made a few days after they begin taking the herbs.

Formula: Xue Fu Zhu Yu Tang (Drive Out Stasis in the Mansion of Blood Decoction).

It can be modified with the following herbs:

Jiang Xiang (Dalbergiae odoriferae Lignum)

Dan Shen (Salviae miltiorrhizae Radix)

Tan Xiang (Santali albi Lignum)

Pu Huang (Typhae Pollen)

Hu Zhang (Polygoni cuspidati Rhizoma)

Herbs that can be added in cases of uprising of Liver yang:

Jue Ming Zi (Cassiae Semen)

Yi Mu Cao (Leonuri Herba)

Gou Teng (Uncariae Ramulus cum Uncis)

Yu Jin (Curcumae Radix)

We should keep in mind that regulating qi herbs may injure the zheng qi, therefore herbs that support and supplement qi like Ren Shen (Ginseng Radix) and Ling Zhi (Ganoderma), which can also lower blood lipids, should be added.

Table 2: Main disharmonies according to biao and ben

Acupuncture points: Neiguan P-6, Shanzhong REN-17, Hegu L.I.-4, Taichong LIV-3, Yanglingquan GB-34.

2. Drain phlegm

This technique will be appropriate for those who suffer from obesity, fatigue and heaviness, discomfort to the point of having pain in the chest, nausea/vomiting, numbness and heaviness of the limbs, tongue with yellow sticky coating, choppy or soft pulse.

Formula: Gua Lou Xie Bai Bai Jiu Tang (Trichosanthes Fruit, Chinese Chive, and Wine Decoction)

The formula can be modified with the addition of herbs that drain phlegm and regulate blood:

Dan Shen (Salviae miltiorrhizae Radix)
Shi Chang Pu (Acori tatarinowii Rhizoma)
Ban Xia (Pinelliae ternatae Rhizoma)
Chen Pi (Citri reticulatae Pericarpium)
Yu Jin (Curcuma Radix)
Ze Xie (Alismatis Rhizoma)

Acupuncture points: Fenglong ST-40, Taibai SP-3, Yinlingquan SP-9, Shuifen REN-9, Neiguan P-6.

3. Strengthening the Spleen qi and leaching out dampness

Symptoms and signs: excess weight, weakness and heaviness in the limbs, lack of appetite, oedema, fullness and flatulence, tendency to loose stool, tongue with white greasy coating, weak pulse.

Formula: Qi Wei Bai Zhu San (Seven-Ingredient Powder with Atractylodes Macrocephala); composed of Si Jun Zi Tang with the addition of:

Mu Xiang (Aucklandiae Radix)
Ge Gen (Puerariae Radix)
Huo Xiang (Pogostemonis/Agastaches Herba)

If needed, it is possible to add herbs that leach out and dry dampness:

Cang Zhu (Atractylodis Rhizoma)
Ze Xie (Alismatis Rhizoma)
Yi Yi Ren (Coicis Semen)

When phlegm obstructs the Heart channel and causes oppression in the chest, one should add:

Yuan Zhi (Polygalae Radix)
Shi Chang Pu (Acori tatarinowii Rhizoma)

Acupuncture points: Sanyinjiao SP-6, Yinlingquan SP-9, Zusanli ST-36, Zhongwan REN-12.

In addition to the Spleen deficiency, there may be Kidney yang deficiency (Kidney failing to support

the Spleen) and in these cases we may see: white face, increase in weight, dizziness, weakness, a large amount of transparent urine, dislike of cold, lumbago and knee pain, impotence, loose stool or daybreak diarrhoea, cold limbs, pale, swollen tongue with white coating, deep and weak pulse.

Formula: Jin Gui Shen Qi Wan (Kidney Qi Pill from the Golden Cabinet) with the addition of herbs to strengthen yang and with a demonstrated pharmacological ability to reduce fats:

Gu Sui Bu (Drynariae Rhizoma)
Gou Qi Zi (Lycii Fructus)
Jin Ying Zi (Rosae laevigatae Fructus)

Acupuncture points: Shenshu BL-23, Pishu BL-20, Feishu BL-13, Zusanli ST-36, Guanyuan REN-4, Taibai SP-3, Zhongwan REN-12.

4. Strengthening the Liver and Kidney yin

Symptoms and signs: thinness, aching of the lower back and feet, forgetfulness, fatigue, dizziness, tinnitus, night sweating, dry mouth, red tongue with scanty coating, thin pulse.

Formula: Zi Wu Wan

Hong Hua (Carthami Flos)
Ge Gen (Puerariae Radix)
Hei Zhi Ma (Sesami Semen nigrum)
He Shou Wu (Polygoni multiflori Radix)
Shan Zha (Crataegi Fructus)
Chen Pi (Citri reticulatae Pericarpium)

Suitable additions:

Nu Zhen Zi (Ligustri lucidi Fructus)
Sang Ji Sheng (Taxilli Herba)
Sheng Di Huang (Rehmanniae Radix/
Shu Di Huang (Rehmanniae Radix preparata)
Gou Qi Zi (Lycii Fructus)

In cases of deficiency heat:

Yin Chen Hao (Artemisiae scopariae Herba)
Di Gu Pi (Cortex Lycii Chinensis Radicis)
Qing Hao (Artemisiae annuae Herba)

In cases of Liver yang rising:

Jue Ming Zi (Cassiae Semen)
Gou Teng (Uncariae Ramulus cum Uncis)
Zhen Zhu Mu (Margaritiferae Concha usta)
Ju Hua (Chrysanthemi Flos)

Acupuncture points: Ququan LIV-8, Sanyinjiao SP-6, Shenshu BL-23.

5. Clearing damp heat from the Liver and Gall Bladder

Symptoms and signs: aching and swelling of the hypochondria and the chest, bitter taste in the mouth, lack of appetite, scanty dark urine, choppy and rapid pulse, red tongue with yellow and sticky coating.

Formula: Qing Dan Xie Huo Tang (Clear the Gallbladder and Drain Fire Decoction)

Acupuncture points: Xingjian LIV-2, Ququan LIV-8, Yanglingquan GB-34, Yinglingquan SP-9, Quchi L.I.-11.

Case study

Female, 24 years of age, student, vegetarian since the age of 10. The father and mother suffer from hypercholesteremia. A total cholesterol 487 was diagnosed for the first time seven years ago. She refuses to receive pharmacotherapy. Secondary complaint: Migraines once a week, accompanied by photophobia and pain beginning in the region of Sizhukong SJ-23 and expanding to the whole head. The pain has a beating character. In addition: dizziness when getting up quickly, dryness in the lips and dry skin. There is a sensitivity to cold and cold at the extremities. Regular menstruation every 28 days, accompanied by blood clots. Since she start taking the contraceptive pill pain appeared, as well as mood swings and a swelling sensation prior to menstruation. Defecation once every two days - regular. Frequent urination. Pain and stiffness in the neck and the shoulders. Pulse - wiry, rapid and choppy. Tongue: thin, a bit dry, sides thin and red, coating rather thick.

Diagnosis: Liver yang rising and blood deficiency.

Treatment strategy: regulate the Liver, clear Liver heat and anchor yang, tonify Spleen and blood.

Treatment:

Chai Hu (Bupleuri Radix) 1.5
 Bai Shao (Paeoniae Radix alba) 4.5
 Fu Ling (Poria) 4.5
 Dang Gui (Angelicae sinensis Radix) 9
 Sheng Di Huang (Rehmanniae Radix) 15
 Gan Cao (Glycyrrhizae Radix) 1.5
 Jue Ming Zi (Cassiae Semen) 2
 Tian Ma (Gastrodiae Rhizoma) 4.5
 Gou Teng (Uncariae Ramulus cum Uncis) 3
 Dan Shen (Salviae miltiorrhizae Radix) 4.5
 Shan Zha (Crataegi Fructus) 4.5

The formula was taken as concentrated powder at a dosage of 6 grams per day for five months during which time there was a decrease in the frequency of the migraines and their intensity.

Blood Tests: Trig 126, HDL 39, LDL 241, Total 300.

A year after the beginning of the treatment: HDL 46, LDL 212, Total 268. ■

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