The Relationship Between Clinical Syndromes of Phlegm-Dampness and Blood Lipid Profiles in Patients with Dyslipidemia at Hai Phong Traditional Medicine Hospital

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ABSTRACT

Objectives: To investigate the prevalence and correlation between clinical patterns of Phlegm Syndrome and blood lipid indices in patients with dyslipidemia at Hai Phong Traditional Medicine Hospital. *Subjects and Methods:* A cross-sectional descriptive study was conducted on 163 patients who visited and received treatment at Hai Phong Traditional Medicine Hospital from November 2024 to the end of May 2025. *Results*: The mean age of the study group was 67.32 ± 10.06 years, with female patients accounting for 60.12%. The average Body Mass Index (BMI) was 23.09 ± 2.69. A significant proportion of patients exhibited unhealthy eating habits and low physical activity, accounting for 71.78% and 72.39%, respectively. The Spleen Deficiency with Phlegm-Dampness pattern constituted the highest proportion among the patients, at 30.67%. Mean Cholesterol and mean LDL-C levels in the Spleen Deficiency with Phlegm-Dampness pattern were significantly higher compared to other patterns. No significant difference was observed in mean Triglyceride levels among the six Phlegm patterns. Mean HDL-C levels were higher in the Qi Stagnation and Blood Stasis pattern compared to the other five patterns. *Conclusion:* The Spleen Deficiency with Phlegm-Dampness pattern constitutes the highest proportion among the clinical patterns of Phlegm syndrome in Traditional Chinese Medicine (TCM). Furthermore, significant differences were observed in blood lipid profiles among the various clinical patterns of Phlegm syndrome.
Keywords: Phlegm syndrome, clinical patterns, dyslipidemia

INTRODUCTION

Dyslipidemia is a condition characterized by elevated concentrations of lipid components such as total cholesterol (TC), plasma triglycerides (TG), or both, or increased low-density lipoprotein cholesterol (LDL-C) levels, while simultaneously experiencing reduced high-density lipoprotein (HDL-C) levels, thereby promoting the process of atherosclerosis.

According to Traditional Chinese Medicine (TCM), lipid metabolism disorders fall within the scope of Phlegm-Dampness Syndrome. There are various causes leading to the accumulation of Phlegm-Dampness in the body, which can be solitary or combined. These include congenital predispositions, body constitution (either obese or frail), irregular dietary habits, damage to Zang-Fu organs due to emotional factors and decline of Tian Gui. The pathogenesis often involves a dietary habit of consuming excessive fatty and sweet foods, which causes the Spleen to produce an abundance of Yin, accumulating into a condensed fatty substance. This

affects fluid metabolism and generates Phlegm-Dampness. Alternatively, it can stem from a constitutional predisposition to obesity with insufficient Yang Qi, or from a naturally inactive lifestyle combined with a diet rich in rich, fatty, and sweet foods. Working in a sedentary environment with little physical activity also hinders the smooth circulation of Qi, affecting fluid transport and leading to disease. Furthermore, prolonged emotional suppression or chronic stress can impair the Liver's dredging and dispersing function, resulting in stagnated Qi circulation and affecting the Spleen's function. This can generate or exacerbate the accumulation of Phlegm-Dampness. Additionally, sweet foods, in small quantities, can soothe the Liver during stress and support the Spleen; however, in large quantities, they impair Spleen function. Therefore, Disharmony between the Liver and Spleen often arises from an imbalance in this condition, leading to disease. Moreover, aging plays a role in this mechanism. When a person is over 40 years old, Yin begins to decline by half, and Yang Qi tends to weaken not long after. Yin Deficiency reduces nourishment and moistening of the Liver, thereby causing Qi stagnation. Yang Deficiency results in the Kidney Yang failing to warm the Spleen Yang, leading to impaired transformation and transportation function. This prevents the smooth circulation of body fluids, causing them to accumulate in the body over time and lead to disease. Consequently, Yang Deficiency often exacerbates the accumulation of Phlegm-Dampness in the body.

Phlegm-Dampness accumulation, on one hand, impedes Qi circulation, affecting the ascending and descending functions of the Zang-Fu organs. On the other hand, its retention and stagnation in the meridians impair the circulation of Qi and Blood, leading to Qi Stagnation and Blood Stasis. Furthermore, prolonged stagnation of Phlegm-Dampness can transform into heat, disturbing Yang Qi and consuming the body's Yin components. Phlegm-Dampness is characterized by its heavy, turbid, and sticky nature, which often causes persistent and prolonged illnesses.

Currently, with the trend of combining modern medicine and traditional medicine, finding the correlation between clinical patterns of Phlegm Syndrome and lipid profile indices in patients with dyslipidemia holds significant importance in both disease prevention, diagnosis, and treatment. The question arises: do lipid indices correlate with clinical patterns? To answer this question, our research group conducted the study titled "The Relationship Between Clinical Syndromes of Phlegm-Dampness and Blood Lipid Profiles in Patients with Dyslipidemia at Hai Phong Traditional Medicine Hospital" with two objectives:

1. To investigate the prevalence of clinical patterns of Phlegm Syndrome in patients with dyslipidemia at Hai Phong Traditional Medicine Hospital from November 01, 2024, to May 31, 2025.

2. To investigate the correlation between Traditional Chinese Medicine (TCM) symptoms and lipid profile indices in the study population.

SUBJECT AND METHOD

Study Subjects:

Inclusion criteria:

- Patients over 18 years old, regardless of gender or occupation, who voluntarily participate in the study.

- Patients diagnosed with dyslipidemia meeting at least one of the following criteria:

+ Total Cholesterol (TC) $\geq$ 5.2 mmol/l (200mg/dl).

+ Triglycerides (TG) $\geq$ 1.7 mmol/l (150 mg/dl).

+ LDL-C $\geq$ 2.58 mmol/l (130 mg/dl).

+ HDL-C < 1.03 mmol/l (40 mg/dl).

Exclusion Criteria

- Patients currently taking lipid-increasing medications or corticosteroids.

- Pregnant patients, or those with acute medical conditions.

- Patients with language disorders, impaired consciousness, or dementia who cannot communicate with the physician or follow instructions.

- Patients who do not cooperate during the examination process or provide incomplete survey data.

Study Location and Time:

Study location: Hai Phong Traditional Medicine Hospital

Study period: from November 01, 2024, to May 31, 2025.

Research Methods:

Study design: Cross-sectional descriptive study

Sample size: Convenience sampling method

Procedure: Patients admitted for examination and inpatient treatment at clinical departments of Hai Phong Traditional Medicine Hospital

Patients who meet the selection criteria, were interviewed using a unified questionnaire to collect clinical characteristics and record lipid profile indices.

Variables and Study Indicators:

1. General information: Age, gender, BMI, co-morbidities, lipid profile indices (Total Cholesterol, Triglycerides, HDL-C, LDL-C).

2. Traditional Chinese Medicine (TCM) symptom and syndrome variables. Phlegm Syndrome according to TCM is divided into 6 patterns: Spleen Deficiency with Damp-Phlegm, Spleen-Kidney Yang Deficiency, Liver-Kidney Yin Deficiency, Liver depression and spleen deficiency, Damp-Heat, and Qi Stagnation and Blood Stasis, following the diagnostic and treatment guidelines of Traditional Medicine accompanied by Decision No. 5013/QD-BYT dated December 1, 2020 [2]. TCM symptom variables have two values: present or absent. The syndromes and symptoms used in the study are defined based on references from specialized TCM texts on symptomology and TCM terminology from the World Health Organization (WHO). Any symptoms not defined in TCM texts will be referenced from modern medicine texts [3].

3. Correlation between clinical patterns of Phlegm Syndrome and lipid profile indices.

Statistical Analysis

Data collected in the study were processed using statistical probability with SPSS 20.0 software. Research values are presented as mean ± standard deviation ($\bar{X} \pm SD$) with 95% confidence intervals. Research results are considered statistically significant when $p < 0.05$.

Research Ethics

The study was approved by the Protocol Approval Council of Hai Phong University of Medicine and Pharmacy according to Decision No. 2285/QD-YDHP dated October 30, 2024. All research data will be kept completely confidential and used solely for research purposes. The research results and proposed recommendations will be used for community health purposes and no other purposes.

RESULTS

General characteristics of the research subjects

Table 1. General characteristics of the research subjects

Characteristic	Number (n)	Percentage (%)
Gender		
Male	65	39.88
Female	98	60.12
Age group(n=163)		
18 – 40	5	3.07
41 – 60	29	17.79
> 60	129	79.14
Average value ($\bar{\bar{X}} \pm$ SD)	67.32 ± 10.06	
Body mass index (BMI)		
< 18.5	5	3.07
18.5 - 22.9	73	44.79
23 - 24.9	53	32.52
25 - 29.9	29	17.79
≥ 30	3	1.84
Average value ($\bar{\bar{X}} \pm$ SD)	23.09 ± 2.69	
Irregular diet		
Yes	46	28.22
No	117	71.78
Sedentary lifestyle		
Yes	45	27.61
No	118	72.38

Female patients accounted for 60.12%. Male patients accounted for 39.88%. The average age of the research group was 67.32+ 10.06. The lowest age was 32 years old, the highest was 89 years old. The age group >60 accounted for a high proportion of 79.14%.

The average body mass index was 23.09+2.69. Of which, the proportion of overweight patients with BMI from 23 or higher accounted for 52.15%. The majority of patients had irregular eating habits and little physical activity, accounting for 71.78 and 72.39, respectively.

Table 2. Characteristics of blood lipid indices

Variable	N	Mean	Standard deviation	Minimum value	Maximum value	Unit
CHOL	163	5.81	0.91	1.52	7.71	
TG	163	2.36	1.01	0.59	7.05	
LDL-C	163	3.24	1.02	0.56	5.63	Mol/L
HDL-C	163	1.68	0.41	0.97	3.22	

The patient's blood lipid indices were respectively Cholesterol: 5.81 ± 0.91 (mmol/L); Triglyceride: 2.36 ± 1.01 (mmol/L); LDL-C: 3.24 ± 1.02 (mmol/L); HDL-C: 1.68 ± 0.41 (mmol/L)

Proportion of clinical forms according to TCM

Table 3. Proportion of clinical forms of Phlegm Syndrome according to TCM

Clinical form according to Traditional Medicine	Number (n)	Rate (%)
Spleen deficiency with Damp-Phlegm	50	30.67
Spleen-Kidney Yang Deficiency	29	17.80
Liver-Kidney Yin Deficiency	22	13.50
Liver depression and spleen deficiency	24	14.72
Damp-Heat	20	12.27
Qi Stagnation and Blood Stasis	18	11.05
Total	**163**	**100**

The percentage of patients with spleen deficiency with Damp-Phlegm is the highest at 30.67%, the second highest is Spleen-Kidney Yang Deficiency at 17.80%, the lowest is stagnant qi and blood with 11.05%.

Correlation between blood lipid indices and clinical forms

Table 4. Correlation between blood lipid indices and clinical forms of phlegm

Blood lipid indices	Disease	Average value	95% confidence interval	p
Cholesterol Index	Spleen deficiency with Damp-Phlegm	5.94 ± 0.92	5.68 – 6.20	
	Spleen-Kidney Yang Deficiency	5.74 ± 0.80	5.43 – 6.04	
	Liver-Kidney Yin Deficiency	6.32 ± 0.69	6.01 – 6.62	**0,015**
	Liver depression and spleen deficiency	5.47 ± 1.01	5.04 – 5.89	
	Damp-Heat	5.51 ± 0.94	5.07 – 5.95	
	Qi Stagnation and Blood Stasis	5.76 ± 0.81	5.35 – 6.16	
Triglycerid Index	Spleen deficiency with Damp-Phlegm	2.24 ± 0.77	2.02 – 2.46	
	Spleen-Kidney Yang Deficiency	2.55 ± 0.65	2.30 – 2.79	**0,47**
	Liver-Kidney Yin Deficiency	2.41 ± 0.94	1.99 – 2.83	
	Liver depression and spleen deficiency	2.34 ± 1.12	1.86 – 2.81	

	Damp-Heat	2.61 ± 1.28	2.01 – 3.21	
	Qi Stagnation and Blood Stasis	2.09 ± 1.57	1.31 – 2.88	
LDL-C Index	Spleen deficiency with Damp-Phlegm	3.48 ± 1.00	3.19 – 3.77	
	Spleen-Kidney Yang Deficiency	3.16 ± 0.97	2.79 – 3.52	**0,001**
	Liver-Kidney Yin Deficiency	3.80 ± 0.82	3.44 – 4.16	
	Liver depression with spleen deficiency	2.78 ± 1.17	2.29 – 3.28	
	Damp-Heat	2.75 ± 1.07	2.25 – 3.25	
	Qi Stagnation and Blood Stasis	3.04 ± 0.88	2.61 – 3.48	
HDL-C index	Spleen deficiency with Damp-Phlegm	1.59 ± 0.38	1.49 – 1.70	
	Spleen-Kidney Yang Deficiency	1.60 ± 0.43	1.44 – 1.77	**0,029**
	Liver-Kidney Yin Deficiency	1.58 ± 0.33	1.44 – 1.73	
	Liver depression and spleen deficiency	1.79 ± 0.42	1.61 – 1.96	
	Damp-Heat	1.5 ± 0.34	1.59 – 1.91	
	Qi Stagnation and Blood Stasis	1.90 ± 0.49	1.66– 2.15	

- The mean Total Cholesterol (TC) showed a statistically significant difference ($p < 0.05$) in at least two of the six disease patterns. Among these, Spleen Deficiency with Damp-Phlegm and Liver-Kidney Yin Deficiency predominated, with mean values of 5.94 ± 0.92 and 6.32 ± 0.69, respectively.

- The mean Triglyceride (TG) levels showed no statistically significant difference among the clinical patterns ($p > 0.05$).

- The mean LDL-C levels showed a statistically significant difference ($p = 0.001$, $p < 0.05$) in at least two of the six disease patterns. Among these, Spleen Deficiency with Damp-Phlegm and Liver-Kidney Yin Deficiency predominated, with mean values of 3.48 ± 1 and 3.80 ± 0.82, respectively.

- The mean HDL-C levels showed a statistically significant difference ($p = 0.029$, $p < 0.05$) in at least two of the six disease patterns. Among these, Qi Stagnation and Blood Stasis predominated with a prominent mean value of 1.90 ± 0.49.

DISCUSSION

General Characteristics of the Study Subjects

Female patients accounted for 60.12%, while male patients accounted for 39.88%. The average age of the study group was 67.32 ± 10.06 years, with the youngest patient being 32 years old and the oldest being 89 years old. The age group > 60 years old accounted for a high proportion of 79.14%. This result is consistent with the survey by Phan Van Minh et al. on some side effects of the Xiao Dam-03 formula in patients with dyslipidemia, which found the average age of the study subjects to be 63.57 ± 9.7 years, with the youngest being 43 years old, the oldest 85 years old, and the most

common age group being > 60 years old (71.4%) [4]. Tran Dinh Thoan et al.'s study on the current status of lipid metabolism disorders in the elderly in rural Thai Binh in 2020 showed that the prevalence of dyslipidemia in people aged 60-74 years was 65.9% [5]. This result is also similar to the author Nguyen Tuan Nghia et al. When studing of the effects of PT Powertrim capsules on 90 patients with lipid metabolism disorders of spleen deficiency, phlegm and dampness and spleen and kidney yang deficiency, showing that the gender distribution ratio was 66.67% of patients were female, 33.33% were male [6] and at the same time, the results of risk factors related to moderate eating and physical activity also showed that the majority of patients had irregular eating habits and little physical activity, accounting for 71.78%; 72.39%, respectively. These are the main risk factors leading to the symptoms of Dyslipidemia in adults.

The characteristics of blood lipid indices in the study were Cholesterol: 5.81 ± 0.91 (mmol/L); Triglyceride: 2.36 ± 1.01 (mmol/L); LDL-C: 3.24 ± 1.02 (mmol/L); HDL-C: 1.68 ± 0.41 (mmol/L). The results measured in the study showed that most patients had a Dyslipidemia level of 2b or higher according to the WHO Lipoprotein Blood Classification [7]. The higher the level of disorder, the higher the risk of cardiovascular disease, diabetes, stroke and other serious diseases. and which is comparable with the results from studies by Nguyen Tuan Nghia et al with the ratio of blood lipid indices before treatment was TC 5.86± 0.87; TG 2.49± 1.31; LDL-C 3.31± 0.96; HDL-C 1.12± 0.30 (mmol/L) [6]

The rate of clinical forms of Phlegm syndrome in patients with Lipid Metabolism Disorders at Hai Phong Traditional Medicine Hospital

From the results in Table 3, it can be seen that patients with the spleen deficiency with phlegm-dampness type account for the highest rate of 30.67%; followed by the Spleen-Kidney Yang Deficiency type account for 17.8%; the liver stagnation and spleen deficiency type account for 14.72%; the liver-kidney yin deficiency type account for 13.5%, the internal Damp-Heat type account for 12.27%; the lowest is the Qi stagnantion and blood stasis type account for 11.05%. By definition, Metabolic disorders are a group of diseases related to the way the body converts food and energy into compounds necessary for life activities. Metabolic processes in the body help convert and use energy, protein, fat and carbohydrates from food, while eliminating waste. When this process is disrupted, the body cannot metabolize one or more nutrients effectively, leading to accumulation or deficiency of these substances in the body, causing symptoms and diseases[7]. According to traditional medicine, Phlegm Syndrome is formed by the accumulation of eating habits that are too high in fat and sugar, causing the metabolism of the Spleen and Stomach to be irregular, leading to phlegm and dampness. The ancients have a saying "Fat people often have a lot of phlegm" which is very similar to the research results that 52.15% of patients are overweight or more. At the same time, patients with the Spleen deficiency with Damp-Phlegm syndrome often have symptoms of a flabby tongue with teeth marks, a slow and rapid pulse and a thick, white, viscous coating, and a full abdomen, all of which have the characteristics of internal phlegm and dampness. Our research results are similar to those of author Tang

Khanh Huy and colleagues who studied physical forms on 390 patients with metabolic syndrome at the Ho Chi Minh City Hospital of Traditional Medicine and Thong Nhat Hospital and found that the percentage of people with low phlegm constitution was the highest at 31.79%. The percentage of people with low phlegm constitution was 25.64%.[8]

Correlation between traditional medicine symptoms and blood lipid indices in the study subjects

The results in Table 4 show that there is a correlation between blood lipid indices and clinical forms of Phlegm syndrome. Specifically, the average levels of Cholesterol, LDL-C, HDL-C between at least two of the 6 disease groups have statistically significant differences with $p < 0.05$. The average Triglyceride level has no difference with $p > 0.05$. The difference in average Cholesterol and average LDL-C levels in the Spleen deficiency with Damp-Phlegm and Liver-kidney yin deficiency forms is statistically significant compared to the remaining 4 forms. The Qi stagnation and blood stasis form has a higher increase in HDL-C than the remaining 5 forms with statistical significance.

LDL-C is the main transporter of cholesterol in the blood, mainly in the form of CE. LDLs are transported into cells and undergo degradation by Lysosomes, releasing free cholesterol. Macrophages produced from monocytes in the blood can capture LDL through the scavenging receptor, this process occurs at normal LDL concentrations and is enhanced by increased LDL stores. The capture of LDL by macrophages in the arterial wall is an important factor in the pathogenesis of atherosclerosis, when macrophages are overloaded with cholesterol esters, they turn into foam cells, which are components of atherosclerotic plaques. [7]. Therefore, the correlation between the Cholesterol and LDL-C index in the two forms of Liver-Kidney Yin Deficiency and Spleen-Damp Phlegm is an important factor that helps warn of the increased rate of atherosclerosis in patients with these two forms of disease accompanied by increased blood lipid index in clinical practice.

According to author Tang Khanh Huy et al, a study of the physical forms of 390 patients with metabolic syndrome at the Ho Chi Minh City Traditional Medicine Hospital and Thong Nhat Hospital found that the correlation between the physical form of TCM and metabolic factors was increased waist circumference, increased triglycerides and increased blood pressure. [8]

CONCLUSION

The average age of the study group was $67.32 + 10.06$ years old, female patients accounted for 60.12% with an average BMI of $23.09 + 2.69$. The majority of patients had irregular eating habits and little physical activity, accounting for 71.78% and 72.39%, respectively. Patients with spleen deficiency with Damp-Phlegm accounted for the highest proportion, 30.67%. The average cholesterol and LDL-C levels in spleen deficiency and phlegm-dampness and kidney-yin deficiency were higher than in the other types. There was no difference in the average triglyceride level among the 6 clinical types of phlegm. The average HDL-C level in the Qi stagnation and blood stasis type was higher than in the other 5 types.

RECOMMENDATIONS

For patients with a history of hyperlipidemia with spleen deficiency, phlegm and dampness and liver-kidney yin deficiency, it

is recommended to check for vascular damage caused by atherosclerotic plaques created by macrophages engulfing LDL cells.

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