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The Auxiliary Role of Personalized Diet Guidance in the Control of Blood Lipid Level in Patients with Hyperlipidemia

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Abstract

Objective: To analyze the effect of individualized dietary guidance in controlling blood lipid levels in the treatment of hyperlipidemia patients. **Methods:** 30 patients with hyperlipidemia were divided into experimental group and control group. The control group received routine guidance during symptomatic treatment, and the experimental group received personalized diet guidance on the basis of the control group. **Results:** The levels of TC, TG and LDL-C in the experimental group were lower than those in the control group, the levels of HDL-C were higher than those in the control group, and the proportions of immoderate drinking, overeating, high-calorie diet and smoking were lower than those in the control group, and $P < 0.05$; **Conclusion:** Individualized dietary guidance for patients with hyperlipidemia is helpful to better control the level of blood lipids and correct the dietary behavior of patients.

Keywords

Hyperlipidemia, Personalized Diet Guidance, Blood Lipid Level, Control Effect

1. Introduction

In recent years, with the continuous improvement in people's living standards, the incidence of various diseases has shown an upward trend. Hyperlipidemia, hypertension, and hyperglycemia are collectively referred to as the "three highs", and are among the most common conditions encountered in clinical practice. Hyperlipidemia primarily refers to a group of disorders caused by abnormalities in the body's fat metabolism and transport, leading to excessively high lipid levels and, in some cases, abnormally low levels of low-density lipoproteins. This con-

dition has many risk factors, most of which are closely related to unhealthy dietary habits [1].

If hyperlipidemia is not treated promptly and effectively, prolonged abnormal blood lipid levels can easily lead to atherosclerosis, which in turn can trigger various cardiovascular diseases. Currently, the primary clinical approach to treating hyperlipidemia is medication, with the main goal being to control blood lipid levels within a reasonable range. However, since the occurrence of hyperlipidemia is strongly linked to dietary habits, fully realizing the effectiveness of medication requires not only strict adherence to prescribed treatments, but also the development of scientifically sound eating habits. Therefore, combining medication with personalized dietary guidance is crucial [2].

Dietary guidance refers to nutrition and health recommendations tailored to individuals or groups, aiming to help people establish healthy eating habits and promote overall well-being. This article explores the supportive role of personalized dietary guidance in the treatment process of patients with hyperlipidemia, as detailed below.

2. Materials and Methods

2.1. General Information

From January 2022 to December 2022, a total of 60 patients with hyperlipidemia admitted to our hospital were selected as subjects for this study. Using a random number table, the patients were divided into a control group and an experimental group, with 30 cases in each group.

Control group: 12 males and 18 females, aged between 45 and 77 years, with a mean age of (65.31 ± 5.28) years. The duration of illness ranged from 1 to 8 years, with an average of (5.25 ± 0.86) years.

Experimental group: 14 males and 16 females, aged between 40 and 72 years, with a mean age of (65.36 ± 0.84) years. The duration of illness ranged from 2 to 10 years, with an average of (5.20 ± 0.81) years.

The baseline characteristics of both groups were tested using statistical analysis software. The results showed that the P-values were greater than 0.05, indicating that the observed indicators were comparable between the two groups.

Inclusion Criteria:

All enrolled cases met the diagnostic criteria for hyperlipidemia as outlined in the Guidelines for the Prevention and Treatment of Dyslipidemia in Chinese Adults. After hospital admission, patients underwent laboratory tests that confirmed the diagnosis of hyperlipidemia, defined as a total cholesterol (TC) level exceeding 5.72 mmol/L and a triglyceride (TG) level exceeding 1.7 mmol/L. Additionally, all patients were fully informed about the details of this study and were able to cooperate in completing the research procedures.

Exclusion Criteria:

Patients were excluded if their abnormal blood lipid levels were caused by other diseases; if they had severe comorbid conditions; if they had a known allergy to

atorvastatin or Xuezhikang; or if they failed to complete follow-up during the course of the study.

2.2. Methods

After all patients were diagnosed with hyperlipidemia, they received symptomatic treatment aimed at lowering blood lipid levels. During this process, the control group was given standard guidance, which included advising patients to reduce the intake of oily and salty foods, adhere strictly to prescribed medications, engage in appropriate physical activity, and undergo regular medical checkups.

In contrast, the experimental group received personalized dietary guidance in addition to the standard measures provided to the control group. The implementation steps were as follows:

2.2.1. Calculating the Patient's Standard Body Weight

General information for each patient was collected, and their standard body weight was calculated based on this data. The formula used is as follows:

$$\text{Standard body weight (kg)} = \text{Actual height (cm)} - 105$$

2.2.2. Calculating the Patient's Total Caloric Intake

Nursing staff were required to accurately calculate the patient's daily total caloric needs based on their height and weight. This calculation served as the basis for optimizing the patient's dietary plan to ensure a reasonable total caloric intake. The method for calculating total daily calories is as follows:

$$\text{Total daily caloric intake} = \text{Patient's daily energy expenditure} \times (\text{Height} - 105)$$

2.2.3. Principles of Personalized Dietary Guidance

When implementing personalized dietary guidance for patients with hyperlipidemia, the following principles should be strictly followed:

1) Energy Balance Principle:

Medical staff should determine the patient's total daily dietary energy intake based on their physiological condition, daily activity level, work intensity, and standard body weight, in order to help the patient maintain an ideal body weight.

2) Nutritional Balance Principle:

For patients with hyperlipidemia, maintaining balanced nutrition is essential. Therefore, personalized dietary plans should be designed to provide all essential nutrients required daily, in appropriate proportions.

3) Dietary Variety Principle:

Referring to the 2016 edition of the Chinese Dietary Guidelines (Food Guide Pagoda), dietary plans should include a diverse and reasonable mix of food types. This ensures that patients receive all necessary nutrients while also helping to control blood lipid levels.

4) Simplicity and Feasibility Principle:

Dietary recommendations should be tailored to the patient's living conditions, financial situation, and local food availability. Foods should be prepared using ap-

propriate cooking methods to enhance practicality and patient adherence.

2.2.4. Personalized Dietary Guidance

1) Control of Energy Intake:

Based on the patient's individual standard body weight and total caloric requirement, the daily intake ratio of the three major macronutrients should be maintained within the following range:

Protein: 15%, Carbohydrates: 65%, Fat: 20%.

Patients should be advised to reduce their intake of plant-based proteins, wheat starch, and amino acid-rich foods. When preparing meals, plant-based oils should be prioritized, while fried foods should be minimized. Foods high in cholesterol and fatty acids should be strictly avoided.

2) Strict Smoking and Alcohol Cessation:

Patients should be educated on the importance of quitting smoking and drinking. They should be made aware that certain harmful substances in tobacco can cause microvascular constriction, increasing the risk of myocardial infarction, angina, and other cardiovascular conditions. Additionally, patients should be informed that alcohol contains more calories per gram than carbohydrates of the same weight, which can lead to fluctuations in blood lipid levels. Patients should be actively encouraged to quit smoking and drinking.

2.2.5. Dietary Supervision

During the implementation of personalized dietary guidance, it is essential to strengthen supervision. Patients were provided with a diary to record the types of food consumed each day, allowing for an approximate calculation of daily energy intake. Nursing staff regularly reviewed these diaries to assess whether patients were strictly following the personalized dietary plan.

A consultation phone line was made available to patients, reminding them to seek help from medical staff immediately if any problems arose. Additionally, patients received a weekly follow-up phone call to discuss their experiences with the personalized dietary guidance and to assess their adherence to the plan.

For patients with low compliance, re-education sessions were conducted to reinforce the importance of the dietary plan until their level of adherence improved.

2.3. Observation Indicators

1) Comparison of blood lipid levels before and after treatment in both groups

The observed indicators included total cholesterol (TC), triglycerides (TG), high-density lipoprotein cholesterol (HDL-C), and low-density lipoprotein cholesterol (LDL-C). For each patient, 5 ml of fasting venous blood was collected both before and after treatment. The samples were analyzed using our hospital's automated biochemical analyzer along with the corresponding reagents [3].

2) Assessment of improvement in unhealthy dietary habits in both groups after 3 months

The changes in patients' unhealthy eating behaviors were evaluated and rec-

orded in both groups after a 3-month intervention period.

2.4. Statistical Methods

First, relevant case data of elderly patients were collected using Excel to build a database. A dual-entry method was employed to input the data, followed by verification. Measurement data were expressed as means (± standard deviation), while count data were presented as frequencies (n) or percentages. For comparisons before and after the intervention, if the measurement data followed a normal distribution, a t-test was used; if not, the rank-sum test was applied. The results were expressed using the chi-square (χ^2) test. A P-value of less than 0.05 was considered statistically significant.

3. Results

3.1. Comparison of Blood Lipid Levels before and after Guidance in the Two Groups

Before receiving guidance, there were no statistically significant differences in TC, TG, HDL-C, or LDL-C levels between the two groups ($P > 0.05$). After different types of guidance were provided, both groups showed improvements in blood lipid levels. However, the experimental group had significantly lower levels of TC, TG, and LDL-C, and significantly higher HDL-C levels compared to the control group, with $P < 0.05$. Details are shown in Table 1.

Table 1. Comparison of blood lipid levels before and after guidance between the two groups (mmol/L).

Group	TC		TG		HDL-C		LDL-C	
	Before	After	Before	After	Before	After	Before	After
Experimental Group	8.15 ± 1.84	4.24 ± 0.58	4.65 ± 1.05	2.64 ± 0.28	1.11 ± 0.01	1.72 ± 0.21	4.51 ± 0.87	2.84 ± 0.21
Control Group	8.17 ± 1.81	5.16 ± 0.78	4.61 ± 1.06	2.96 ± 0.65	1.13 ± 0.15	1.45 ± 0.17	4.54 ± 0.81	3.35 ± 0.57
t	0.070	8.464	0.241	4.044	0.595	9.923	0.226	7.481
P	>0.05	<0.05	>0.05	<0.05	>0.05	<0.05	>0.05	<0.05

Table 2. Comparison of unhealthy dietary habits before and after guidance between the two groups [n (%)]

Behavior	Time	Experimental Group	Control Group	χ^2	P
Uncontrolled Drinking	Before	6 (20%)	7 (23.33%)	0.005	>0.05
	After	2 (6.67%)	6 (20%)	2.308	<0.05
Binge Eating	Before	3 (10%)	3 (10%)	0.024	>0.05
	After	0 (0%)	4 (13.33%)	4.286	<0.05
High-Calorie Diet	Before	6 (20%)	7 (23.33%)	0.010	>0.05
	After	1 (3.33%)	5 (16.67%)	2.963	<0.05
Smoking	Before	5 (16.67%)	4 (13.33%)	0.024	>0.05
	After	1 (3.33%)	4 (13.33%)	1.964	<0.05

3.2. Comparison of Unhealthy Dietary Habits before and after Guidance between the Two Groups

The results showed that, before the intervention, there were no statistically significant differences between the two groups in the proportions of patients who engaged in excessive alcohol consumption, overeating, high-calorie diets, or smoking ($P > 0.05$). However, after the intervention, the proportions of these unhealthy behaviors were significantly lower in the experimental group compared to the control group ($P < 0.05$). See Table 2 for details.

4. Discussion

In recent years, with changes in people's lifestyles and dietary habits, the incidence of hyperlipidemia has shown a continuous upward trend. This condition is particularly common among the elderly. If not treated in a timely and effective manner, the progressive course of the disease can lead to atherosclerosis of the arteries, which may in turn trigger serious complications such as myocardial infarction, coronary heart disease, and stroke, posing a significant threat to patients' lives [4].

Therefore, in clinical practice, the primary approach to treating hyperlipidemia is lipid-lowering therapy, aimed at reducing the risk of cardiovascular events. Since the onset of hyperlipidemia is largely related to unscientific dietary patterns, effective and healthy eating habits must accompany lipid-lowering medications to maximize treatment effectiveness [5].

The above analysis evaluated the effects of implementing personalized dietary guidance in patients with hyperlipidemia who were concurrently receiving lipid-lowering medications, and compared the outcomes with those receiving routine care. The results showed that patients receiving personalized dietary guidance had lower levels of TC, TG, and LDL-C, and higher levels of HDL-C compared to those under routine care. Furthermore, personalized dietary guidance was more effective than routine care in improving unhealthy behaviors such as excessive alcohol consumption, overeating, high-calorie diets, and smoking ($P < 0.05$).

The reason for this is that personalized dietary guidance for patients with hyperlipidemia is based on the characteristics of the condition and provides comprehensive dietary recommendations. This helps enhance patients' individual awareness, enabling them to fully recognize the importance and necessity of a healthy diet. As a result, they are more likely to modify their behavior, restrict harmful habits, and develop better eating practices, which in turn play a supportive role in keeping blood lipid levels within a reasonable range [6].

It is worth noting, however, that to accurately assess the auxiliary effect of personalized dietary guidance on blood lipid control in hyperlipidemia patients, it is essential to fully consider and control for confounding variables such as medication adherence, comorbidities, and lifestyle factors. By improving study design, strengthening patient management, and enhancing health education, we can more accurately evaluate the effectiveness of personalized dietary guidance and provide more targeted treatment recommendations for patients with hyperlipidemia. At

the same time, we must acknowledge the potential influence of these confounding factors on the results and interpret the findings with caution.

5. Conclusion

Personalized dietary guidance plays an important supportive role in controlling blood lipid levels in patients with hyperlipidemia. However, the small sample size and lack of long-term follow-up in this study may limit the reliability and validity of the results. Some patients may not strictly follow dietary recommendations due to various reasons (such as lack of self-discipline or difficulty in changing established habits), which could affect lipid control outcomes. Therefore, future research should involve larger sample sizes, multi-center studies, and extended follow-up periods. In addition, efforts should be made to strengthen health education and promote adherence to medical advice.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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