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Applications of Chinese Dietary Pattern Prescriptions in the Long-term Management of Cerebrovascular Diseases

Zhenglu Zhang *

Department of Inner Mongolia Clinical Medical College, Inner Mongolia Medical University, Hohhot, 010010, China

* Corresponding author: 1910718238@mail.sit.edu.cn

Abstract. Stroke is one of the major causes of death and disability worldwide. Proper diet is an important primary prevention strategy in the long-term management of cerebrovascular diseases. The currently popular MD, DASH, MIND, and Japanese dietary patterns all have significant significance in research on the prevention and treatment of cerebrovascular diseases. Due to the vast geographical area and dietary differences, there is currently a lack of comprehensive epidemiological research on dietary patterns and cerebrovascular diseases in China and a unified definition of dietary patterns. This article summarizes the characteristics of the above four dietary patterns and combines them with modern Chinese nutrition theory and epidemiological research evidence. Explore dietary patterns that are suitable for Chinese residents and provide reference for Chinese general practitioners in formulating dietary prescriptions for the long-term management of cerebrovascular diseases.

Keywords: Cerebrovascular diseases; dietary pattern; epidemiological studies; long-term management.

1. Introduction

Stroke is one of the leading causes of death and disability worldwide [1]. Dating back 100 years ago in our country, Malnutrition caused by famine has become the main risk factor leading to population death [2]. In recent years, China has become one of the countries with the largest number of stroke deaths and new cases in the world. Effective primary prevention measures are urgently needed to reduce the increasingly serious disease burden, and a reasonable diet is an important primary prevention strategy in the long-term management of cerebrovascular diseases (CVDs) [3]. Compared with studying a single dietary component, dietary patterns are more conducive to describing the overall quality of the diet, are closer to daily life, and are easier to promote [4-5]. Therefore, more and more studies focus on the role of dietary patterns in primary prevention of stroke. Currently, the Mediterranean Diet (MD), Dietary Approaches to Stop Hypertension (DASH), Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND), and the Japanese dietary pattern are considered healthy dietary patterns around the world [6]. A large number of studies have suggested that the MD dietary pattern, DASH dietary pattern, and Japanese dietary pattern have a protective effect on CVDs. However, the correlation between the MIND dietary pattern and CVDs requires further research to provide evidence. Due to the large differences in culture and diet among countries around the world, the above four healthy dietary patterns may not be completely suitable for China. China has a vast territory and different food cultures and habits. The food structure has also undergone significant changes with China's economic transformation.

This article provides an overview of the four major dietary patterns that are currently popular around the world, and discusses and summarizes their impact on CVDs. At the same time, based on the latest version of Chinese dietary guidelines and combined with the current dietary pattern research, modern nutrition theory and epidemiological research evidence, suggestions are provided for exploring my country's dietary patterns in CVDs. As general practitioners, everyone needs to actively treat patients not only for CVDs, but also for complications of the disease. The general practitioners need to give residents more advice on diet and exercise to avoid the occurrence of CVDs. How to transform the

dietary pattern into a healthy prescription for every resident on the basis of exploring China's dietary patterns is particularly important. And it is of great significance for the long-term management of CVDs.

2. Research Status and Development Trends of Global Dietary Patterns

Stroke is one of the major causes of death and disability worldwide [1]. Dating back to 100 years ago in China, malnutrition due to famine has become the main risk factor for population death [2]. In recent years, China has become one of the countries with the largest number of stroke deaths and new cases in the world. Effective primary prevention measures are urgently needed to reduce the increasingly serious disease burden, and a reasonable diet is important in the long-term management of CVDs. Primary prevention strategies. Compared with studying a single dietary component, dietary patterns are more conducive to describing the overall quality of the diet, are closer to daily life, and are easier to promote [4]. Therefore, more and more studies focus on the role of dietary patterns in primary prevention of stroke. Currently, the more popular dietary patterns in the world include the Mediterranean Diet (MD), the Dietary Approaches to Stop Hypertension (DASH), the Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND), Japanese dietary patterns have been considered healthy after years of research.

2.1. The MD Dietary Pattern

The MD dietary pattern originated from the seven-country study, which mainly refers to the dietary pattern of countries located along the Mediterranean Sea. Take whole grains, vegetables, fruits, beans, nuts, olives, etc. as the main food, and use olive oil as the main source of additional fat. It is recommended to consume a large amount of seafood and fish, moderate intake of poultry, eggs, milk and dairy products, and alcohol, and limit the intake of red meat. It also includes local healthy lifestyle characteristics, such as physical exercise and adequate rest and so on [7]. A series of correlation studies have been conducted based on the MD dietary pattern. For example, the Spanish PREDIMED intervention study on CVDs by adding virgin olive oil and nuts found that the MD pattern diet has a protective effect on CVDs [8]. Researchers conducted a 12-year follow-up cohort study on nearly 26,000 healthy American women based on their adherence to MD dietary patterns and found that those with higher compliance can indeed reduce the risk of CVDs. At the same time, this study also found that the factors that this dietary pattern can reduce the risk of CVDs are mainly related to inflammatory biomarkers, glucose metabolism, insulin resistance, and BMI. This also provides a theoretical basis for the MD dietary pattern to reduce the risk of CVDs [9]. Whether it is a randomized controlled trial or a cohort study, it is suggested that the MD dietary pattern has a protective effect on people at risk of CVDs. However, the correlation research on MD dietary patterns is currently mainly conducted in the Mediterranean region, and there are currently few related research fields in China. It may be related to the differences in food culture and eating habits between the two places.

2.2. The DASH Dietary Pattern

The DASH dietary pattern originated in the 1990s. This dietary pattern emphasizes low sodium, reducing the intake of red meat, sweets, and sugary drinks, and recommends increasing the intake of fruits, vegetables, low-fat dairy products, and whole grains [10]. In a US randomized controlled crossover trial of the DASH diet and the typical US diet, the DASH diet combined with low sodium was found to reduce the risk of heart damage and the DASH diet was associated with lower high-sensitivity troponin I and high-sensitivity C-reactive protein levels. High-sensitivity C-reactive protein is an inflammatory marker that can be used to predict stroke risk, so its decrease may indicate that the effect of the DASH diet on stroke is mediated through inflammatory markers [11]. One of the few cohort studies on the DASH diet currently conducted in Asia found that this dietary pattern can also reduce the mortality rate of CVDs. The DASH dietary pattern emphasizes a low-sodium diet. A large number of studies have confirmed that a low-sodium diet can change blood pressure and reduce the mortality rate of CVDs. However, other aspects of the DASH dietary pattern require a

large number of interventional clinical trials in the later stage to prove that this dietary pattern has a protective effect on the CVDs of Asian populations.

2.3. The MIND Dietary Dattern

The MIND dietary pattern originated from a study that combined the MD and DASH dietary patterns. This dietary pattern focuses on limiting the intake of saturated fat and increasing the intake of fresh fruits and vegetables, especially emphasize foods that are good for your brain (green vegetables, nuts, etc.) [12]. The first study on the correlation between the MIND dietary pattern and stroke was a controlled study from Iran. Through food frequency questionnaire and MIND dietary score assessment, it was found that those who strictly followed the MIND dietary pattern had a lower risk of stroke. Some studies have also found that the MIND dietary pattern can also promote the decline of cognitive function after stroke. Studies have shown that nuts contain α-linolenic acid, which is associated with anti-inflammatory, anti-atherosclerotic and anti-thrombotic properties. Therefore, it is currently speculated that the protective effect of the MIND dietary pattern on CVDs may be related to it [13]. However, there is still a lack of large amounts of experimental data to confirm its relevance, and this model is currently rarely implemented in China, which may be related to residents' eating habits.

2.4. The Japanese Dietary Pattern

The Japanese dietary pattern originated in 1960. When comparing mortality statistics of various countries, it was found that Japan has the longest average life expectancy. In a study that analyzed and compared the Japanese Diet Index (JDI) scores, it was found that those with higher scores Dietary index scores were significantly associated with lower risk of death. Among those who ate more seaweed, pickled vegetables, green vegetables, fish and green tea, the risk of all-cause mortality was reduced, and high-density lipoprotein cholesterol and atherosclerosis index were significantly improved among the participants [14]. However, this study currently lacks large-scale clinical intervention trials to confirm the endpoints of CVDs, and the overall construction of Japanese dietary patterns still lacks a unified evaluation method. This dietary health model also encourages a lifestyle of healthy eating combined with exercise, which has certain reference value for the improvement of healthy lifestyles in China.

With the transformation of China's economy, the dietary structure of the country's residents has undergone significant changes. The intake of animal foods increased significantly, the intake of cooking oil and salt greatly exceeded the recommended intake, while the intake of grains, vegetables, eggs, and fish was significantly insufficient [15]. Due to China's vast territory and the influence of the natural geographical environment, the dietary differences between the north and the south are obvious. Although China carried out nutritional epidemiological surveys based on Chinese residents many years ago, there is currently a lack of comprehensive epidemiological research on dietary patterns and CVDs in China and a unified definition of dietary patterns.

Table 1. The Comparison Between Among Different Dietary Patterns

Dietary component	MD Dietary Pattern [7]	DASH Dietary Pattern [10]	MIND Dietary Pattern [12]	Japanese Dietary Pattern [14]	Guidelines for balanced diets for Chinese residents [15]
fruit	1-2 serving/meal	1-5 times/day	Salad≥1 copy/day	≥1.8 times/day	200-350 g/day
vegetable	≥2 serving/meal	4-5 times/day	≥1 copy/day	≥5.4 times/day	300-500 g/day
cereal	1-2 serving/meal	7-8 times/day	≥3 copy/day	Rice≥3 bowls/day	50-150 g/day
Dairy products	2 serving/day	2-3 times/day	Cheese≤1 copy/day		300-500 g/day
Beans, nut	1-2 serving/day	4-5 times/week	≥1 copy/two days	≥6 times/week	25-35 g/day
Meat product	Red meat<2 serving/week, White meat 2 serving/ week	≤2 times/day	≥2 times/week	<4 times/week	120-200 g/day
Marine product	≥ 2 serving/week		≥ 1 time/week	≥7 times/week	≥2 times/week
Source of evidence	Umbrella review, system assessment, randomized controlled trial, cohort study	Umbrella review, system assessment, cohort study	Cohort study	System assessment, cohort study	Guidelines/expert consensus

As shown in table 1, MD, DASH, MIND, and Japanese dietary patterns all emphasize the intake of grains, fresh fruits, and vegetables, while the MD dietary pattern places more emphasis on the intake of unsaturated fatty acids, DASH places more emphasis on low-sodium diet, and Japanese dietary patterns place greater emphasis on the intake of soy products. In addition, MD and Japanese dietary patterns always emphasize the combination of healthy diet and exercise, and the MD dietary pattern even includes adequate rest and emphasis on social interaction with others. Compared with the above four global popular dietary patterns and combined with the dietary guidelines for Chinese residents, it is currently concluded that in the entire dietary structure, the intake of whole grains, vegetables, olive oil, nuts, seafood, milk, soy products and other foods, as well as appropriate exercise and adequate rest have significant benefits in improving CVDs, the intake of red meat, sweets, and sugary drinks is significantly related to the occurrence of CVDs, which is in line with the structural requirements of the Chinese Dietary Guidelines. At present, MD, DASH and Japanese dietary patterns already have rich research experience, but the research on the correlation between MIND dietary patterns and CVDs is still in its infancy. Regarding China's dietary patterns, China has carried out nutritional epidemiological surveys based on Chinese residents many years ago, such as the China Health and Nutrition Survey (CHNS) started in 1989, which has accumulated a solid research foundation for the construction of healthy dietary patterns in China. In recent years, some scholars have formed a number of "Chinese healthy dietary patterns" that are in line with the characteristics of their regions based on the cultural background and eating habits of the Chinese people, combined with nutritional theory and expert experience. However, there is a lack of comprehensive epidemiological studies to provide evidence of its role in CVDs. In exploring the impact of Chinese dietary patterns on cerebrovascular diseases, we must not only actively explore the four popular dietary patterns and provide standardized recommendations on various types of food, exercise, rest, etc. in conjunction with the Chinese Dietary Guidelines, but also pay more attention to and actively

explore various studies on Chinese dietary patterns in CVDs. The work content of general practitioners is to take the patient as the center, the family as the unit, and the service characteristics of continuous, comprehensive and personalized care. However, as China's population ages, the incidence of CVDs is getting worse. Explore how general practitioners use dietary prescriptions to achieve the goals of prevention and treatment of CVDs, with long-term management as the main direction, and lay a solid foundation for subsequent professional, rational and high-quality services.

3. Conclusion

This article summarizes the effects of different dietary patterns on cerebrovascular diseases by summarizing the characteristics of MD, DASH, MIND and Japanese dietary patterns that are currently popular in the world. It was found that in the dietary pattern, the intake of whole grains, vegetables, olive oil, nuts, seafood, milk, soy products and other foods, as well as appropriate exercise and adequate rest have significant benefits in improving cerebrovascular diseases. The intake of red meat, sweets, and sugary drinks is significantly related to the occurrence of cerebrovascular disease. In China, there is currently a lack of systematic research on the application of effective dietary patterns in the prevention and treatment of cerebrovascular diseases. Therefore, based on the experience of the above four dietary patterns, Chinese traditional healthy eating habits, and combined with modern nutrition theory and epidemiological research evidence, it is necessary to construct a healthy dietary pattern that is suitable for Chinese people. General practitioners, as the health gatekeepers of residents, should actively explore the application of dietary prescriptions in the long-term management of cerebrovascular diseases. A large number of prospective cohort studies and interventional trials that follow up on stroke and other events need to be carried out, which is of great significance for the prevention and treatment of cerebrovascular diseases in China.

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