

Dietary Nutrition and Dietary Design for Hypertensive Patients

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Abstract With the rapid development of the social economy, the transformation of people's lifestyles, and the continuous improvement of their quality of life, the number of deaths caused by cardiovascular diseases such as stroke, angina, and myocardial infarction accounts for 30% of all deaths. Among them, 62% of strokes and 49% of myocardial infarction-related deaths are associated with hypertension. Currently, the prevalence of hypertension in China is high, with a clear growth trend and increasing harm. Therefore, it is becoming increasingly important for the general population to have a correct understanding of hypertension and to effectively implement early prevention, timely treatment, and dietary improvement. By analyzing and summarizing the hazards, complications, causes, and nutritional principles for hypertensive patients, a survey questionnaire was used to investigate 10 hypertensive patients to understand their dietary and lifestyle habits and analyze the causes of hypertension. A weekly nutritional diet was designed for hypertensive patients, and the most representative day was selected for nutritional analysis. Corresponding nutritional recommendations are provided for hypertensive patients.

Keywords hypertension; nutritional diet; dietary design

Hypertension is one of the main factors leading to premature death and disability worldwide. In addition to genetic factors, diet and lifestyle also have an important impact on blood pressure levels. Dietary nutrition and meal design are of great significance for blood pressure control and complication prevention in hypertensive patients. Therefore, this article will explore the dietary nutrition and meal design for hypertensive patients, aiming to provide references for clinical nutritional support and health management.

This article discusses the dietary nutritional needs and meal design principles for hypertensive patients, formulates corresponding nutritional recommendations and recipes for different situations, and proposes nutritional education strategies to help hypertensive patients scientifically manage their diet and improve their health status. Finally, the main viewpoints and conclusions of the full text are summarized, aiming to provide practical guidance for the dietary nutrition and meal design of hypertensive patients.

1 Overview of Hypertension

1.1 Definition

In fact, the disease known as "hypertension" mainly refers to the condition where blood pressure in the heart and brain is excessively high. When an adult's diastolic blood pressure exceeds 90 mmHg, or systolic blood pressure exceeds 140 mmHg, they can be confirmed to have hypertension. Hypertension is characterized by increased systemic arterial blood pressure (SBP and DBP) as the main clinical manifestation. It coexists with other cardiovascular risk factors and can lead to functional or organic damage to organs such as the heart, brain, and kidneys [1]. Primary hypertension accounts for about 95% of all hypertensive patients in China. It is a disease with increased blood pressure as the main clinical symptom and is also one of the main risk factors for cardiovascular diseases [2], causing serious interference with the normal structure and function of major organs such as the myocardium, brain, and kidneys, and even leading to decreased organ function. Secondary hypertension refers to increased blood pressure due to a specific disease or cause, accounting for about 5% of all hypertensive patients.

1.2 Diagnosis

Blood pressure values measured at the brachial artery site during quiet rest can be used to diagnose hypertension, but hypertension cannot be determined based on one or two blood pressure readings alone. Long-term follow-up is needed to observe changes in blood pressure and the overall level. Once hypertension is diagnosed, it is important to promptly distinguish whether it is primary or secondary. The classification of primary hypertension in adults is shown in Table 1.

Table 1 Classification of primary hypertension in adults

Category	Systolic Pressure / mmHg	Diastolic Pressure / mmHg
Normal Blood Pressure	<120	<80
High Normal	120~139	80~89
Hypertension		
Grade 1 (Mild)	140~159	90~99
Grade 2 (Moderate)	160~179	100~109
Grade 3 (Severe)	≥ 180	≥ 110
Isolated Systolic Hypertension	≥ 140	<90

1.3 Clinical Manifestations

Generally, the specific clinical symptoms of hypertensive patients are as follows:

Early Stage: When patients first notice a sudden increase in blood pressure, there are no obvious symptoms. However, once this condition persists, mild symptoms such as headache, neck discomfort, dizziness,

decreased sleep quality, and anxiety may occur. A few people may also experience chest tightness and palpitations. However, patients often do not realize they have hypertension and mistake these symptoms for neurasthenia.

Mid-stage: This refers to the stage when the hypertensive patient's condition has progressed to the middle phase. Symptoms start with headache, followed by dizziness, and finally nausea and vomiting. In severe cases, syncope and shock may occur.

Late Stage: This refers to the stage when the hypertensive patient's condition has progressed to the advanced phase. The condition evolves from initial external symptoms to complications involving major organs throughout the body [3], including coronary heart disease, cerebral arteriosclerosis, cerebrovascular infarction, and renal arteriosclerosis. Severe cardiovascular and cerebrovascular diseases can seriously threaten the patient's life.

1.4 Hazards and Complications of Hypertension

Hypertension is a common cardiovascular disease, but its pathogenesis is not fully understood. Long-term hypertension can accelerate the development of medium and large arteries by affecting their structure and function [4].

1.4.1 Heart Disease

The harm of hypertension is mainly reflected in the damage to the cardiovascular system. Coronary heart disease, also known as ischemic heart disease, is caused by the narrowing of coronary arteries due to hypertension, leading to insufficient blood supply. The harm of hypertension is mainly reflected in the damage to the heart. When hypertension affects the heart, it often causes changes in cardiac structure and function. If blood pressure remains elevated for a long time, it increases the load on the left ventricle, causing left ventricular hypertrophy and dilation, which can eventually lead to heart failure.

1.4.2 Cerebral Hemorrhage

Damage to the brain caused by hypertension mainly manifests as damage to cerebral blood vessels. Long-term hypertension can lead to cerebral ischemia, degeneration, and may even form cerebral aneurysms, which can trigger cerebral hemorrhage. Increased blood pressure can also lead to arteriosclerosis and the formation of blood clots. Intracerebral hemorrhage (ICH) is one of the most common complications in patients with advanced hypertension.

1.4.3 Kidney Disease

Chronic hypertension can increase pressure in the glomeruli, leading to glomerular fibrosis and atrophy, and subsequently causing renal arteriosclerosis. As the disease progresses, kidney function gradually deteriorates, eventually developing into renal failure. Therefore, early diagnosis, detection, and treatment of hypertensive patients are essential to minimize damage.

1.5 Risk Factors for Hypertension

1.5.1 Genetic Factors

Hypertensive patients show significant familial aggregation. If both parents have hypertension, their children have a prevalence rate as high as 46%; if one parent has hypertension, the probability of the child having hypertension is 28%; if both parents have normal blood pressure, the child's probability of having the disease is only 3%.

1.5.2 Dietary Factors

1.5.2.1 Sodium Intake

Sodium ions are an important factor causing hypertension. In traditional Chinese dietary habits, the daily intake of salt is relatively high, averaging 9-13 g per person per day [5]. Excessive sodium intake seriously affects residents' blood pressure, causing hypertension. Sodium retention can lead to increased extracellular fluid, increased cardiac output, and elevated blood pressure. For every 2 g increase in daily per capita salt intake, diastolic blood pressure increases by 1.2 mmHg and systolic blood pressure increases by 1.2 mmHg. A low-salt diet can effectively improve the symptoms of hypertension.

1.5.2.2 Excessive Energy Intake

The incidence of hypertension is significantly higher in obese people than in the normal population. The average Body Mass Index (BMI) for Chinese men is 21-24.5 kg/m², and for women is 21-25 kg/m². There is a significant positive correlation between BMI and blood pressure. Studies show that for every 1 kg/m² increase in baseline BMI, the risk of developing hypertension within 5 years increases by 9%. By controlling energy intake, weight can be reduced, thereby lowering blood pressure.

1.5.2.3 Fat and Cholesterol

Obesity is a major factor inducing diseases such as hypertension. Studies show that 65% of patients have a BMI above the normal level [6]. High-fat, high-cholesterol foods can easily induce atherosclerosis. Therefore, excessive consumption of animal fats or cholesterol is not conducive to the prevention and treatment of hypertension.

1.5.3 Excessive Alcohol Consumption

Studies show a linear relationship between alcohol consumption and blood pressure; both systolic and diastolic blood pressure increase with increasing alcohol consumption. The incidence of hypertension increases significantly among people who drink more than 50g of alcohol per day. Heavy drinking may also cause stroke. Studies show that long-term alcohol consumption increases the levels of catecholamines and corticosteroids in the body, increases the activity of renin-angiotensin, vasopressin, and aldosterone, leads to disorders in sodium-potassium pump activity, abnormal ion transport, increased intracellular Ca^{2+} concentration, intensified vasoconstriction response, increased peripheral resistance, and ultimately leads to increased blood pressure.

1.5.4 Smoking

Nicotine in cigarettes can cause peripheral vasoconstriction, thereby accelerating arteriosclerosis and leading to increased blood pressure. When smoking, the increase in adrenaline and noradrenaline can cause accelerated heartbeat and increased systolic and diastolic blood pressure. In addition, nicotine in tobacco has a certain impact on the efficacy of antihypertensive drugs.

1.5.5 Psychological and Work Pressure

In the process of social development, with increasing competition, people's pace of life continues to accelerate, which not only brings more pressure but also causes a series of changes in the body. For example, catecholamines in the body increase, leading to vasoconstriction, increased blood pressure, and increased burden on the heart. "Traditional Chinese Medicine" records: the seven emotions (joy, anger, worry, thought, sadness, fear, fright) are related to the internal organs; imbalance of yin and yang, poor circulation of qi and blood, leads to various diseases. Therefore, being in a state of tension, anxiety, and fear for a long time can easily lead to hypertension. In addition, unpleasant stimuli, such as indifference, nitpicking, criticism, annoyance, sadness, and noise, may also lead to hypertension.

2 Nutritional Principles for Hypertensive Patients

2.1 Limit Sodium Intake

The daily salt intake in Chinese people's daily life is generally very high, which is not conducive to lowering blood pressure. In fact, 3g of salt per day can meet the body's demand for sodium, but due to different dietary habits and preferences, salt intake is much higher than 3g. WHO recommends 3-6g of

edible salt per person per day, while the Chinese Nutrition Society, based on China's national conditions, recommends that adults consume 6g of edible salt per day. Therefore, daily diet should be mainly light, eat less soy sauce, pickled foods (such as bacon, salted fish, pickles, pickled vegetables, etc.), monosodium glutamate, etc. At the same time, when cooking, you can add some vinegar, which can both enhance the flavor of the dish and make it easier to accept a low-salt diet.

2.2 Control Weight, Avoid Overweight or Obesity

High-energy, high-sugar foods are easily converted into fat in the human body, leading to increased blood sugar and obesity. Therefore, by reasonably controlling weight, risk factors related to obesity can be effectively reduced. At the same time, weight management also helps improve diseases such as insulin resistance, diabetes, and hyperlipidemia.

2.3 Supplement Adequate Calcium and Magnesium

Both calcium and magnesium can regulate vasodilation and contraction. Increasing calcium intake can significantly improve the excretion of sodium and water, which has a significant promoting effect on the prevention and treatment of hypertension [7]. Calcium and magnesium have antihypertensive effects; magnesium has the effect of dilating peripheral blood vessels. Both of these effects can protect the heart and prevent arteriosclerosis [8]. Foods rich in calcium include milk, shrimp, fish, etc.; foods rich in calcium include wheat bran, red beans, soybeans, mushrooms, etc.; foods rich in magnesium include beans, shiitake mushrooms, longan, etc.

2.4 Choose Foods Containing High-Quality Protein

Protein is an important nutrient. Severe deficiency of protein in the human body may endanger life or even lead to death. Protein contains substances such as methionine and taurine, which have the function of regulating blood pressure, can increase sodium excretion in urine, thereby inhibiting the effect of sodium ions on blood pressure. Soybeans are rich in high-quality plant protein and can effectively prevent cardiovascular diseases. Therefore, hypertensive patients should eat more protein-rich foods, such as high-quality plant-based protein like soybeans, and high-quality animal-based protein like fish, chicken, beef, milk, etc. Plant-based protein intake should account for at most half of the total protein intake [9].

2.5 Reduce Fat and Cholesterol Intake

High-fat, high-cholesterol diets can easily lead to arteriosclerosis and obesity, so dietary fat should be controlled below 25% of total energy [10]. When cooking, the best ratio of vegetable oil to animal oil is 1:0.5. This is because the polyunsaturated fatty acids, vitamin E, and phospholipids contained in vegetable oil can inhibit cholesterol absorption, accelerate cholesterol decomposition and excretion, and play a significant role in preventing and treating cardiovascular diseases. Animal oil is rich in saturated fatty acids, and saturated fatty acids are rich in cholesterol, which can easily lead to arteriosclerosis and obesity. Therefore, in terms of diet, hypertensive patients should try to eat less animal oil and eat more vegetable oils, such as corn oil, soybean oil, rapeseed oil, peanut oil, olive oil, tea oil, etc., and try to minimize the consumption of foods high in cholesterol, such as animal offal, fat, abalone, butter, cream, egg yolk, etc. Cooking methods are suitable for steaming, boiling, and stewing.

2.6 Choose Fibrous Foods and Complex Carbohydrates

Foods rich in fiber can help gastrointestinal peristalsis, accelerate cholesterol excretion, and thus achieve the purpose of lowering blood lipids. Therefore, eat more foods high in fiber, such as corn, millet, whole wheat flour, root vegetables, algae, potatoes, vegetables and fruits, etc. [11]. When consuming sugar, try to choose complex carbohydrates such as starch, corn, millet, etc., and use less glucose, fructose, and sucrose.

2.7 Quit Smoking and Limit Alcohol Consumption

Smoking is a major cause of hypertension, and long-term smoking can also cause large artery atherosclerosis; the intima of small arteries will gradually thicken, causing the entire blood vessel to slowly harden. Therefore, it is best for people with hypertension not to smoke. Excessive drinking can cause harm to the body and also increase blood pressure. The Chinese Nutrition Society recommends the standard for "moderate drinking" for adults: men should not drink more than 25g of alcohol per day, and women should not drink more than 15g of alcohol per day [12].

3 Questionnaire and Analysis

3.1 Basic Information

3.1.1 Survey Subjects

10 people with hypertension from different regions and different industries.

3.1.2 Survey Method

The questionnaire survey method was used. 10 questionnaires were distributed and 10 were recovered, with a recovery rate of 100%. The questionnaire was based on reality to understand the problems in the physical condition, dietary habits, and lifestyle habits of hypertensive patients, thereby reflecting the bad tendencies of hypertensive patients in diet and life.

3.2 Basic Information Entry

The basic information of the survey subjects is shown in Table 2.

Table 2 Basic Information Survey of Hypertensive Patients

No.	Gender	Height / cm	Age / Years	Weight / kg
1	Male	175	25	84
2	Female	158	45	67
3	Male	180	45	90
4	Male	170	48	89
5	Female	160	20	60

No.	Gender	Height / cm	Age / Years	Weight / kg
6	F female	165	55	69
7	M male	179	23	88
8	F female	180	30	79
9	F female	163	71	70
10	F female	162	69	65

3.3 Cause Analysis

Among the 10 questionnaires surveyed, the survey results show the following characteristics. One is genetics. About 60% of hypertensive patients have a family history, and if there are hypertensive patients in the family, the likelihood of offspring developing hypertension will increase. The second is obesity and overweight. In today's society, people's living standards are constantly improving, their dietary standards are gradually increasing, and food is becoming more diverse. People eat more but exercise less, which leads to an increasing number of obese people. Obesity is more likely to cause high blood pressure, with a 25% higher risk than non obese people. Thirdly, excessive intake of sodium. Many people enjoy salty foods, as salt can raise blood pressure and damage the cardiovascular system, making it a recognized killer of cardiovascular diseases. Fourthly, drinking alcohol. More than 40% of people who drink heavily for a long time will suffer from hypertension, and are also prone to various diseases such as stroke, myocardial infarction, and pancreatitis. Five are environmental and spiritual factors. Noise, weather changes, mental stress, and psychological trauma can all increase the risk of hypertension. Therefore, a stable and peaceful

living environment is very important for people's health. Living in a noisy and noisy environment for a long time will inevitably affect the quality of rest and sleep. People with long-term sleep disorders or poor sleep have a much higher risk of developing hypertension than normal people, and excessive mental labor can also easily lead to hypertension.

4 Nutritional Meal Planning for Hypertensive Patients

4.1 Meal Planning Principles

First, control thermal energy, mainly control the intake of staple foods and fats, try to eat less or no candy, pastries, sweet drinks, fried foods and other high-energy foods [13]. Second, reduce the amount of salt used in cooking, try to eat less pickled vegetables and other salty foods. Third, eat less fatty meat and various animal fats, and control the intake of high-cholesterol foods such as animal brains and fish roe. Try to use vegetable oils such as soybean oil, peanut oil, and sunflower seed oil for cooking oil. Fourth, eat more vegetables and fruits, especially dark-colored vegetables, and appropriately increase the intake of seafood, such as kelp, laver, marine fish, etc. [14].

4.2 1-Week Recommended Recipes and Evaluation

As can be seen from Table 3, hypertensive patients should pay special attention in their daily diet: control the intake of thermal energy, try to eat complex carbohydrates, such as foods with more plant fiber in the recipes like corn, millet, oats, etc., use a combination of coarse and fine grains to make nutrition more balanced; the recipes are rich in potassium and calcium, such as potatoes, eggplant, kelp, lettuce, winter melon, etc. Potassium salts can promote cholesterol excretion, increase blood vessel elasticity, and help improve myocardial contraction ability; foods rich in magnesium are abundant, such as green leafy vegetables (celery, lettuce), buckwheat noodles, beans and bean products. Magnesium salts can achieve blood pressure lowering effects by dilating blood vessels; cooking methods should mainly involve less oil, such as tossing, stir-frying, braising, and stewing.

4.3 1-Day Recipe Nutritional Analysis

One patient was selected from the basic information survey form: height 160 cm, weight 60 kg, an office clerk, belonging to a light physical laborer.

Calculation of energy and nutrient intake: Standard weight = 160 - 105 = 55 kg; BMI = Actual weight (kg) / Height squared (m²) = 60 / 1.60² = 23.4 kg/m² (Normal body type); Checking the adult daily energy supply table, the energy supply per unit standard weight for normal weight, light physical laborers is 30 kcal/kg, so the full-day energy supply = 60 kg × 30 kcal/kg = 1,800 kcal; Among the three major heat-producing nutrients, protein accounts for 15% (1~1.2 g/kg standard weight), fat accounts for 25%, carbohydrates account for 60%~65%, cholesterol is less than 300 mg/d, potassium 2.5 g/d, sodium 4~6 g/d, other inorganic salts and vitamins are based on the Dietary Reference Intakes.

Taking Tuesday's recipe as an example, nutritional analysis and calculation were performed. The specific results are shown in Tables 4~7.

Table 3 1-Week Recommended Recipes for Hypertensive Patients

Day	Breakfast	Lunch	Dinner
Monday			Two rice porridge
	Mantou (50g wheat flour), oatmeal Congee (15g oatmeal	Red bean rice (90g glutinous rice, 10g adzuki beans), garlic	(15g japonica rice, 10g millet), fried celery with black fungus
	30g of glutinous rice, 100g of mixed lettuce, boiled chicken	Mud eggplant (150g eggplant, 10g garlic), braised in red	Vegetables (30g black fungus, 150g celery), garlic sprouts and meat
	Egg (50g red skin egg)	Carp chunks (75g carp), 50g citrus fruits	slices (garlic) 80g seedlings, 20g pork, 70g bananas
Tuesday	Cabbage Bun (25g chives, 50g wheat flour, small)	Gold and silver rice (120g glutinous rice, 30g corn grits)	Coarse grain Congee (10g glutinous rice, 5g job's tears, 5g kidney beans), Mantou
	50g cabbage, 25g pork), Congee with corn	Stir fried Tofu with Scallion (100g Southern	(50g wheat flour, 1g

Day	Breakfast	Lunch	Dinner
Wednesday	flour (corn 25g noodles), mixed with melon strips (100g cucumber, 5g chili) Vinegar peanuts (10g peanut kernels, 2g white vinegar)	Tofu, Scallion) 10g)、Sauce beef 25g, stir fried tomatoes, chili peppers (50g tomato, 25g chili), 10g soybean oil	dry yeast), stir fried eggplant and green pepper (eggplant) 100g、15g chili pepper, 10g carrot, fruit platter (citrus) 100g orange, 50g red Fuji apple, 100g Jingbai pear, beans Oil 8g
	Cabbage Bun (50g Wheat Flour, 50g Cabbage, Pig) Meat 25g), corn flour Congee (corn flour 25g), mixed yellow 100g melon, 10g sweet and sour peanuts (10g peanut kernels)	Red bean rice (30g red beans, 100g glutinous rice), mixed Tofu (100g Southern Tofu), Stir fried Three Fresh, Lettuce 75g、Sauce beef (25g beef), 15g pear	Coarse grain Congee (10g japonica rice, 5g glutinous rice, 5g job's tears, kidney beans 5g)、Mash sauce mixed with lettuce (100g of lettuce), crispy and fragrant Carp (Carp 50), Red Extract 50g
	Sweet potato corn flour Congee (20g corn, 30g sweet potato)	Rice (90g glutinous rice), shiitake mushrooms and rapeseed (shiitake mushrooms) 50g、100g rapeseed), shredded pork	Mantou (wheat flour 100g), beef ball and shredded radish soup (beef 25g、White radish 25g), fried Rolls of dried bean milk creams and
Thursday	Spinach and mung bean sprouts (100g mung bean sprouts,		

Day	Breakfast	Lunch	Dinner
Friday	100g spinach)	beans (beans)	celery (celery 100g
	Five spice tofu	150g 、 Pork 25g,	Rolls of dried bean
	rolls (25g per thousand sheets)	Shrimp Slippery (Shrimp 25g), Grass	milk creams 5g, shredded carrot 25g), peach 50g
Friday		Berry 35g	
		Green bean rice (20g	Steamed Chinese
	French bread (100g	green beans, 80g glutinous	sponge cake (100g wheat),
Friday	French pairing bread),	rice), stir fried meat	tremella and lotus seed
	milk	Onion (100g onion,	soup (5g tremella
	200mL 、 Roasted	25g pork), stir fried beans	10g lotus seeds), stir
Friday	broccoli (100g broccoli)	Sprout (100g mung	fried octopus shreds with
		bean sprout), 50g orange	garlic sprouts (100g garlic
			sprouts)
Saturday			Octopus 25g, Kiwi
			35g
	Century egg lean		Chicken Shredded
Saturday	meat Congee (8g lean	Rice (90g glutinous	Buckwheat Noodles (75 g
	pork, 25g japonica rice),	rice), stewed yellow	Buckwheat Noodles,
	steamed bread	croaker (yellow croaker)	Chicken Breast Meat)
Saturday	Head (75g wheat	75g fish), Hetang stir	37.5g) 、 Cleverly
	flour), mixed with	fry (50g lotus root, celery)	mixed lettuce (50g lettuce,
	sesame and spinach	100g、 Cabbage 25g,	100 red tomatoes)
Saturday	(spinach)	Mulberry 50g	g、 5g black fungus
	100g、 Sesame 5g)		and 50g banana
Sunday	Bean paste roll (40g	Green Bean Rice (120g	Steamed Chinese

Day	Breakfast	Lunch	Dinner
	wheat flour), 10g Red bean soup, corn Noodle Congee (corn flour 25g), sauce beef (beef 25g) Mix seaweed shreds (100g seaweed, 10g garlic)	Japonica Rice, 30g Green Bean), Sauce Pork ribs (75g pork chops), stewed pumpkin and potatoes (South) 100g melon, 50g potato, 50g apple	sponge cake (30g wheat flour, 15g corn flour), Congee (10g glutinous rice, 5g glutinous rice, 5g Job's tears, 5g kidney beans), meat Stir fried black fungus and cabbage (100g Chinese cabbage, 10g carrot, black) 5g fungus, 15g pork, 50g orange

Table 4 Breakfast Nutritional Composition Calculation Table

Nutritional Composition	Nutrient Name	Content
	energy/kcal	418
13% of energy is provided by protein, and 27% by fat	protein/g	14
60% energy supply from carbohydrates	fat/g	12
	carbohydrate/g	65
	Vitamin E/mg	6

α -TE

Vitamin C/mg	50
sodium/mg	89
calcium/mg	118

Table 5 Lunch Nutritional Composition Calculation Table

Nutritional Composition	Nutrient Name	Content
	energy/kcal	760
	protein/g	27
	fat/g	17
Protein provides 14% energy, fat	carbohydrate/g	126
provides 20% energy, and carbohydrates	Vitamin E/mg	12
provide 66% energy	α -TE	
	Vitamin C/mg	56
	sodium/mg	362
	calcium/mg	202

Table 6 Dinner Nutritional Composition Calculation Table

Nutritional Composition	Nutrient Name	Content
Protein provides 15% energy, fat provides 20% energy, and carbohydrates provide 65% energy	energy/kcal	577
	protein/g	23
	fat/g	13
	carbohydrate/g	100
	Vitamin E/mg	272
	α-TE	
	Vitamin C/mg	41
	sodium/mg	1835
	calcium/mg	257

Table 7 Full-Day Nutritional Composition Calculation Table

Total Energy	Protein (% of Energy)	Fat (% of Energy)	Carbohydrate (% of Energy)
1,815 kcal	65 g (14%)	43 g (21%)	292 g (65%)
Energy Distribution	Breakfast 24%	Lunch 43%	Dinner 33%

Health guidance recommendations for hypertensive patients are: on the premise of ensuring adequate nutrient supply, control total energy intake; increase the intake of vegetables and fruits, consume 400g of vegetables and 200~300g of fruits daily, which can prevent blood viscosity and prevent cardiovascular and cerebrovascular diseases; appropriately increase the intake of coarse grains, such as buckwheat, oatmeal,

corn, millet, etc., and promote the consumption of fresh corn in summer and autumn; appropriately increase the intake of edible fungi, such as black fungus, white fungus, etc.; the diet should be light; life should be regular, maintain a relaxed and happy mood, and avoid anger and melancholy. A good and calm mood is conducive to maintaining stable blood pressure; regular physical examinations should pay attention to abnormal changes in indicators such as blood pressure, blood lipids, and blood viscosity to prevent the occurrence of cardiovascular and cerebrovascular diseases.

5 Conclusion

In recent years, there have been more and more hypertensive patients, and the probability of primary hypertension occurring during adolescence is also increasing. The cause of hypertension is not a single factor, but the result of a combination of multiple factors. Nowadays, besides genetic factors, most hypertensive patients are caused by poor dietary habits, smoking, excessive alcohol consumption, and long-term mental stress.

Through the investigation of hypertensive patients, it can be seen that under the influence of multiple factors such as heredity, diet, excessive alcohol consumption, smoking, psychological and work pressure, some people are prone to hypertension. It is recommended that hypertensive patients follow the nutritional principles of limiting sodium salt, controlling weight, supplementing with sufficient calcium and magnesium, choosing foods containing high-quality protein, reducing fat and cholesterol intake, choosing fibrous foods and complex carbohydrates, quitting smoking, and limiting alcohol consumption. They should eat more foods such as potatoes, eggplant, kelp, lettuce, winter melon, buckwheat noodles, soy milk, and bean products. Develop healthy eating and living habits, strengthen blood pressure regulation, maintain a relaxed and happy mood, and avoid anger and melancholy.

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