

# The Effect of Exercise and Diet Interventions on Primary Hypertension Patient

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## 1 RESEARCH PURPOSE

As the number of hypertension patients increases sharply around the world, the prevention and treatment of hypertension become particularly prominent. In view of this, this study probes into the combined intervention of exercise and diet for primary hypertension patients, in order to provide scientific basis for the promotion of hypertension prevention.

## 2 RESEARCH METHODS

### 2.1 Research Object

Patients with primary hypertension who meet the inclusion criteria in the outpatient department of the hospital; patients, who voluntarily accept and are able to satisfy the requirements of dietary intervention, have not been treated with drugs at the first visit or are in the stable phase for drugs taken (patients whose antihypertensive drugs and sorts of drugs have been adjusted in the latest 3 months).

In the end, 100 middle-aged and elderly subjects, 50 males and 50 females aged 40-69, were evenly distributed among different age groups.

### 2.2 Experimental Methods

1. Preparations before experiment: before the experiment, some medical examinations are necessary to conduct so as to exclude the exercise taboos of the people tested and understand their living habits, diet conditions, medication and exercise habits.

2. Implementation of intervention program: Combined intervention, DASH dietary patterns and 5-7 times one-hour exercise (with five options of brisk walking, dancing, running, gymnastics and cycling) with moderate intensity, for 6 months are conducted.

Principles of DASH diet: plenty of fruits, vegetables and low-fat dairy products; reducing the intake of food that are rich in saturated fat, cholesterol and trans fat; appropriate amount of whole grains, poultry, fish and nuts; control the intake of sodium, dessert, sugary drinks and red meat. As for DASH diet, reduction of sodium plays a key role. In addition to standard DASH diet (daily intake of 2300mg), a low sodium version (daily intake of 1500mg) is available for different health needs.

3. Test indexes: (1) Index for the survey of basic conditions: personal basic information, disease, daily physical activity, drugs, and diet. (2) Blood pressure monitoring. It should be completed by the same tester and the cuff should be fixed on the right upper arm of the patient. During the automatic test, the upper arm should remain relatively steady to ensure the validity of the data obtained; the test time is 8:00-10:00 am. (3) Blood biochemical indexes. All subjects should fast for more than 12 hours, and 5ml venous blood sample should be taken the next morning for the test of total cholesterol (TC), triglyceride (TG), fasting blood-glucose and other indicators.

4. Test instruments: (1) Glucometer produced by Roche Group is used in fingertip blood glucose of FBG; (2) the enzyme method is used in TC and TG.

### 2.3 Statistical Methods

The SPSS 10.0 statistical software is used to analyze the one-way variance. The comparison between groups and the paired t test before and after the intervention are conducted for statistical analysis. The difference was statistically significant with  $p < 0.05$ .

Table 1: Systolic and diastolic blood pressure levels (x + s) after intervention.

Systolic blood pressure				Diastolic blood pressure			
Before intervention	After intervention	t	p	Before intervention	After intervention	t	p
155.42 ± 17.71	129.24 ± 6.19	21.25	<0.0001	93.48 ± 11.56	80.89 ± 6.20	12.01	<0.001

Table 2: Blood glucose level (x + s) after the intervention.

Before intervention	After intervention	D-value	t	p
5.63 ± 1.20	5.15 ± 0.504	-0.48 ± 0.90	6.23	<0.001

Table 3: Cholesterol level after intervention (x + s).

Before intervention	After intervention	D-value	t	p
5.10 ± 1.10	4.13 ± 0.24	-0.97 ± 1.01	17.55	<0.001

Table 4: Triglyceride level (x + s) after the intervention.

Before intervention	After intervention	D-value	t	p
2.13 ± 0.97	1.60 ± 0.43	-0.53 ± 0.64	11.62	<0.001

### 3 FINDINGS

#### 3.1 Comparison of Blood Pressure (mmHg) before and after Intervention

After the intervention, the systolic blood pressure decreases. There are significant differences between the two groups before and after intervention with  $p < 0.001$ ; diastolic blood pressure decreases after intervention, and the difference was significant before and after the intervention, with  $p < 0.0001$ , which is available in table 1.

#### 3.2 Comparison of Blood Glucose (mmol/L) Levels before and after Intervention

There are significant difference in blood glucose before and after intervention ( $t=6.23$ ,  $P < 0.001$ ). After intervention, blood sugar decreases by  $0.48 \pm 0.90$

mmol/L, and blood sugar in intervention group decreases obviously, which is available in table 2.

#### 3.3 Comparison of Cholesterol (mmol/L) Levels before and after Intervention

After intervention, the serum cholesterol level decreases obviously, and the difference is significant ( $17.55$ ,  $P < 0.001$ ), which is available in table 3.

#### 3.4 Comparison of Triglyceride (mmol/L) Levels before and after Intervention

After the intervention, the serum triglyceride level decreases obviously, and the difference is significant ( $t=11.62$ ,  $P < 0.001$ ), which is available in table 4.

## 4 CONCLUSION

(1) Reducing the intake of cooking oil, salt and livestock, and increasing the intake of vegetables, fruits and low-fat dairy products are necessary and effective measures for the prevention and treatment of hypertension.

(2) Through balanced dietary intervention and exercise, systolic blood pressure under comprehensive intervention decreases significantly.

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