

Rational approaches to the treatment of hypertension: modification of lifestyle measures

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Hypertension is an important health problem. Informative counseling is required for patients to completely understand the importance of non-pharmacologic treatments. Lifestyle changes such as restriction of salt intake, exercise, restriction of alcohol intake, diet, and weight loss are included in all hypertension treatment guidelines. However, serious motivation is required from the patient and the physician to succeed in this. Although the decrease in blood pressure may be limited with these measures, lifestyle modifications should be continued.

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The five lifestyle modifications recommended in the JNC-7 Guideline for the nonpharmacologic treatment of hypertension include reducing salt intake, exercise, moderation of alcohol consumption, Dietary Approaches to Stop Hypertension (DASH) eating plan, and weight loss (Table 1).¹

WEIGHT REDUCTION

The relationship between weight and blood pressure (BP) has been demonstrated by studies. In one study, a 10-kg increase in weight has caused a 3/2.3 mm Hg increase in blood pressure. This increase has resulted in a 12% increase in the risk of coronary heart disease and a 24% increase in the risk of stroke. Until the ideal body mass index is reached, for every 10 kg of weight that is lost, the BP decreases 5–20 mm Hg.²

As the visceral adipose tissue increases, so does BP. With an increase in visceral adipose tissue, there is increased intake of protein, calorie and carbohydrate, and increase in plasma catecholamines, sympathetic nerve system activity, and insulin secretion. Eventually, renin–angiotensin–aldosterone system (RAAS) activation results in renal sodium retention and increased cardiac output. The increase in sympathetic activation causes insulin resistance and endothelial dysfunction, which consequently lead to an increase in peripheral vascular resistance. The presence of sleep apnea syndrome also contributes to hypertension. Leptin is a mediator released from adipose tissue that has an appetite-reducing effect. In obese humans, leptin resistance and a positive association between leptin and BP have been demonstrated. The levels of angiotensinogen, renin, aldosterone, and angiotensin-converting enzyme have been shown to be significantly higher in obese women than in lean women. There is a linear relationship between weight loss and decreases in BP and this is related to the decrease in the visceral fat mass. When dietary treatment, medical treatment, and invasive or surgical interventions were compared for achieving weight loss, dietary treatment was found to be the most effective way to decrease BP. Especially in the case of weight loss with sibutramine, no changes in BP were observed. However, cardiac side effects were observed in sibutramine. Consequently, weight loss is an important lifestyle modification to lower BP. Approximately 10 kg of weight loss can decrease systolic BP by 5–20 mm Hg.^{1,3}

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Table 1 | Lifestyle modifications to prevent and manage hypertension

Modification	Recommendation	SBP reduction
Weight reduction	Maintain BMI 18.5–24.9	5–20 mm Hg/10 kg
Adopt DASH eating plan	Consume a diet rich in fruits, vegetables, and low-fat dairy products with a reduced content of saturated and total fat	8–14 mm Hg
Dietary sodium reduction	Reduce dietary sodium intake to no more than 100 mmol per day (2.4 g sodium or 6 g sodium chloride)	2–8 mm Hg
Physical activity	Engage in regular aerobic physical activity such as brisk walking (at least 30 min per day, most days of the week)	4–9 mm Hg
Moderation of alcohol consumption	Limit consumption to no more than 2 drinks per day in most men, and to no more than 1 drink per day in women and lighter weight persons	2–4 mm Hg

Abbreviations: BMI, body mass index; DASH, Dietary Approaches to Stop Hypertension.

PHYSICAL ACTIVITY

Aerobic exercise has favorable effects on BP. It causes a 4 mm Hg decrease in average systolic BP and a 3 mm Hg decrease in diastolic BP. Studies have shown that regular aerobic exercise changes the vascular structure by improving endothelium-dependent vasorelaxation and increasing central artery compliance. Both mechanisms reduce peripheral vascular resistance. Insulin resistance also decreases with aerobic exercise. Exercise training also decreases the stimulation of the sympathetic nervous system and reduces the heart rate and cardiac output. Therefore, aerobic exercise (e.g., brisk walking) is recommended for a minimum of 30 min on most days of the week.^{1,4}

RESTRICTION OF ALCOHOL INTAKE

Excessive alcohol consumption causes an increase in BP. With alcohol consumption, the amount, duration, and the form of intake is important. In hypertensive patients, alcohol intake should be limited to 2 or less standard drinks a day. Weekly consumption should not exceed 14 drinks in men and 9 in women. The average volume of a standard drink varies from one country to another. For example, in Japan, the intake is 25 ml. In comparison, the intake is 17.7 ml in the USA and 10 ml in England. In a study with heavy drinkers, the relationship between alcohol intake and hypertension, stroke, and cardiomyopathy has been demonstrated.³ The relationship between alcohol consumption and BP prevalence is linear. In addition, alcohol intake weakens the effects of antihypertensive drugs. An increase in BP is observed after acute alcohol withdrawal. The risk of hypertension is higher when alcohol is not taken together with food. It is suggested that the absorption of alcohol is increased when taken without food.^{1,3}

OTHERS

Emotional and psychological stress can cause hypertension. For this reason, mind and body exercises (Qigong, Thai Chi, transcendental meditation, yoga, breath exercises, and so on) can be performed to lower hypertension. Speaking therapy and stress management may also be helpful. Particularly in traditional Chinese medicine, there are several publications demonstrating that mind and body exercises can also be helpful in metabolic syndrome.

Caffeine is an adenosine receptor antagonist. One hundred and fifty ml of coffee includes 60–120 mg of caffeine and 150 ml of tea includes 20–40 mg of caffeine. This can increase BP by 2.4/1.2 mm Hg. The effects on BP are eliminated with the long-term use of caffeine and nicotine. This is probably due to the development of adrenergic receptor tolerance.

Smoking causes increases in BP and heart rate. The sympathetic nerve system is activated and catecholamine levels are increased. Smoking is a cardiovascular risk factor. However, many epidemiological studies have demonstrated no effect on BP.^{2–4}

COMPLEMENTARY AND ALTERNATIVE MEDICINE

Dark chocolate and cacao reduce blood pressure and this effect is due to flavonoids. A daily 10–30 g intake of dark chocolate can significantly decrease BP. Coenzyme Q 10 is a component of the mitochondrial electron transport chain. It has been observed to reduce BP with 30–150 mg per oral use.⁵

Melatonin is secreted in the absence of light, leading to lower BP during sleep. These findings have led researchers to study melatonin. In hypertension studies, it has been demonstrated that melatonin moderately reduces BP.⁶

Vitamin D inhibits renin production and blocks proliferation of vascular smooth muscle cells. In addition, the use of vitamin D can also lower BP. 25-Hydroxyvitamin D levels should be maintained above 75 nmol/l (30 ng/ml). Studies have shown that acupuncture also has BP-lowering effects.⁵

CONCLUSION

Lifestyle modification measures are safe and effective. They can delay the occurrence of hypertension. They are helpful alongside medical treatment for all stages of hypertension. Although these non-pharmacologic interventions may be difficult for patients and physicians, they should be pursued.

DISCLOSURE

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