

World of Knowledge

Taiwanese DASH diet: an alternative to prevent and stop hypertension

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Abstract

Do you know that a prudent and healthy diet can help you prevent and reverse hypertensive conditions? DASH stands for Dietary Approaches to Stop Hypertension. DASH diet is rich in vegetables, fruits, whole grains, plant proteins/fish/poultry, dairies, and nuts/seeds which were initially investigated and later promoted by National Institute of Health. It is beneficial not only to the prevention and control of hypertension but also to that of ischemic heart disease, stroke, osteoporosis, colorectal cancer, etc. In this article, we would introduce you a DASH diet modified toward Taiwanese culture, its dietary contents and portion sizes in terms of six food groups, and how to apply it in real life. Important website and references are also provided.

Introduction

Hypertension is a risk factor for many detrimental diseases including ischemic heart disease, stroke, chronic kidney diseases, and so on. One fifth of the adults and more than half of the elderly are hypertensive in Taiwan. Older people tend to develop hypertension, since blood pressure (BP) increases gradually with age. Generally speaking, once hypertension develops, life-long medication is required to control it. However, antihypertensive medicine is not the only answer. One can use lifestyle measures to lower BP, particularly when it is at the pre-hypertension phase or at the first stage hypertension. If patients follow a wholesome lifestyle including healthy diet and regular exercise, it is possible that some may reverse their blood pressure back to the normal range and improve their general health. Even for more severe cases, there is potential to reduce the medication dosage.

Traditional non-pharmacological approach

Weight control and sodium restriction are two major lifestyle approaches to reduce BP. The efficacy of weight reduction is well recognized. However, weight rebound after a period of weight loss is a major hurdle. A moderate BP reduction often accompanies a moderate sodium reduction. Only a very strict sodium restriction corresponds to a substantial BP reduction. Due to the practical difficulties in weight control and sodium restriction, DASH diet attracts a lot of attentions when its efficacy is revealed.

How did DASH diet start?

DASH stands for **D**ietary **A**pproaches to **S**top **H**ypertension, the name for a multi-centered clinical trial which was supported by National Institute of Health of the United

States in 1992-1997. A total of 459 participants were randomized into three groups. One group consumed a typical American diet (control group), and another group consumed a diet rich in vegetables and fruits. The third group consumed the DASH diet. In an 8-week trial period, medical centers provided participants with all their foods including three meals, drinks and snacks. All participants had dinners in medical centers, brought breakfasts and lunches home, and maintained their starting body weight and a constant and usual sodium level during the whole period.

BP level of the control group was very stable during the trial, but that of DASH diet group dropped steadily during the first two weeks and maintained afterwards with an average reduction of 5.5 mmHg for systolic blood pressure (SBP) and of 3 mmHg for diastolic blood pressure (DBP). The BP reduction was 11.4 mmHg for SBP and 5.5 mmHg for DBP in hypertensive patients, which approximates the effect of one antihypertensive medicine. The effect of the vegetable-fruit group was in between the control group and the DASH group.

Further analysis of the DASH results indicated that DASH diet was also effective in blood lipid and homocysteine lowering and beneficial to bone health. Many people also use this diet for weight control. DASH diet is now included in JNC VII as an alternative non-pharmacological measure to reduce BP, which is also supported by American Heart Association and American Clinical Nutrition Society. In addition, it was recommended to American adults in the 2005 dietary guidelines.

Prior to 2009, very few people in Taiwan knew anything about DASH. We initiated the DASH teaching material contest in 2008 in collaboration with Taiwan Nutrition Society and Atherosclerosis Society. In 2009, my group designed the Taiwan DASH and collaborated with Tung's Foundation to promote DASH using media campaign and with Shieh Chien University to train cooks and to design 8-day DASH recipes. The survey research center of Academia Sinica performed two telephone surveys this year. Preliminary results showed that DASH is now (November) known by 5% of the adult populations compared to 0% earlier this year in April.

Principles behind DASH diet

DASH diet stresses not just what hypertensive patients should avoid but what they should eat more and how much they should eat. It is a diet high in potassium, magnesium, calcium, dietary fiber, unsaturated fatty acids, but low in fat and saturated fatty acids. The fat-protein-carbohydrate composition is adjusted toward moderate carbohydrate, higher protein, and lower fat. The point is to make a diet enriched with all the beneficial dietary components and low in those with deleterious effects in terms of hypertension and cardiovascular risk. Although DASH-sodium study also included a low sodium component, but the original DASH adopted regular to moderate levels of sodium. It did not focus on weight reduction in the trial. However, DASH-sodium trial showed that combining DASH with low sodium exerted an even stronger effect in BP reduction. DASH Premiere study showed that BP lowering was accompanied by weight reduction when people practices DASH themselves.

We summarize some simplified DASH mechanisms below.

1. Potassium has a cardio-protective effect. Adequate potassium content in the diet can reduce sodium sensitivity. Potassium is rich in vegetables, fruits, and dairy products.
2. Magnesium is involved in many enzymatic reactions in the human body. Adequate amount of magnesium is essential in improving insulin sensitivity. Vegetables, fruits, and various kinds of bran are good sources of magnesium.
3. Calcium may have a moderate effect on BP reduction. Low-fat dairies, various kinds of tofu, dark green vegetables, and sea weeds are good sources of calcium.
4. Dietary fiber slows down sugar absorption rate into circulation and improves insulin resistance. Vegetables, fruits, whole grains, roots and tubers are good sources of dietary fibers.
5. High amount of saturated fat will increase endogenous cholesterol synthesis and increase the risk of atherosclerosis. Most red meats and their products are high in saturated fat. Examples include beef, organ meats, lam, butter, pork and lard.
6. Unsaturated fat extracted from plant seeds has an opposite effect from saturated fat. Examples include various kinds of plant oils.

What is DASH diet like?

Food guide established by Taiwan Department of Health (DOH) describes food patterns in terms of six food groups: staples, vegetables, fruits, protein-rich foods, dairy, and fats and oils. We would like to do the same thing here. However, the distribution of six food groups in DASH is slightly different from the DOH food guide. The foods of choice are defined carefully. The following table provides distribution of six food groups by four energy levels. Readers can first find your level by the amount of foods described and gradually adjust it up or down. This DASH food guide is established based on Taiwanese dietary pattern and culture, therefore it is slightly different from the US DASH.

Subjects	Young women	Elderly men	Middle-aged men	Young men
Energy level	1500 Kcal	1800 Kcal	2000 Kcal	2200 Kcal
Staple (bowl)	1&1/2	2&1/4	2&3/4	3
Vegetable (100 g)	4	5	5	5
Fruit (s)	5	5	5	5
Milk (s)	1&1/2	1&1/2	1&1/2	2
Protein-rich foods (s)	5	6	7	7&1/2
Nuts / seeds (Ts)	1	1	1	1
Fats / oils (ts)	3	4	4	5

S: serving, Ts: tablespoon, ts: teaspoon

(Reference from DM printed by Tung's Foundation)

1. Numbers of servings for vegetables, fruits, dairies, and protein-rich foods are slightly higher than those of Taiwan DOH food guide.
2. Amount of staple foods is slightly less than the DOH recommendation. Whole grains are recommended.
3. Amount of milk and dairy is similar to the DOH food guide. Skim milk and low-fat products are recommended
4. Encourage the use of tofu (other plant proteins), fish, poultry without skin, and lean meat. Eat eggs in moderation.
5. Consume about one tablespoon of nuts and seeds a day.
6. Use vegetable oils for cooking to replace animal fats.

Serving size equivalents (summarized from DM made by Tung's foundation, Taiwan)

Staple foods (one bowl of rice)

One bowl of brown rice and cooked dried beans

Two bowls of whole grain gruel

One mid-sized taro

One large whole wheat steamed bun

Vegetables (100 grams)

A 15 cm diameter-dish size of cooked vegetables

A half bowl of cooked vegetables

Fruits

One small size fruits (kiwi or small orange)

Half of a softball-sized fruits (grape fruit or quava)

One sixth of a volley ball-sized fruits (papaya or honeydew)

Protein-rich foods

Half of palm-sized fish fillet or poultry without skin

Half of boxed tofu

One piece of hard tofu

Dairies (one glass of milk)

One 240 cc glass of low-fat or skim milk

3 tablespoons of slim milk powder

Nuts and seeds (10 grams)

One tablespoon of nuts and seeds

How to practice DASH in everyday life

Some guides and hints are listed as follows on how to select and prepare foods for DASH.

Staple foods: at least two thirds should be intact foods.

Choose whole grains as staple in at least two out of three meals.

Dry beans and roots/tubers can be used interchangeably.

For noodle lovers, enjoy one noodle meal a day, but whole grains or products two meals a day.

One can mix one third of polished rice with brown rice for making cooked rice, if refined staple is not consumed.

Dairies: consume milk in the morning and in the evening and try using milk in dishes

Use low-fat or skim milk or cheese.

Add milk powder into oatmeal, rice gruel, or 100% fruit or vegetable juice.

Put low-fat cheese on top of vegetable dishes in baked dishes.

Add low-fat milk in soups.

Use no or low lactose products, if you are lactose-intolerant.

Vegetables: 2 to 3 vegetable dishes a meal for lunch and dinner with varieties.

Make sure to have some dark colored vegetables every day.

Try vegetables with different textures.

Mix fruit and vegetable into fruit-vegetable juice.

Vegetables into milk, drinks, and steamed rice.

Fruit : five servings a day.

Consume primarily fresh fruits and use 100% fruit juice and non-sweetened dry fruits interchangeably to enrich eating.

Fats, oils and nuts and seeds: use primarily good quality plant oil.

Avoid animal oil rich in saturated fat.

Avoid trans-fat in dehydrogenated oil.

Avoid fried foods.

Use a variety of methods to cook vegetables, including steaming, heating in water, boiling, saucing, and stir-frying. Stir-frying should not be the major cooking method.

Protein-rich foods: 5-7 servings a day, reduce red meat.

Use primarily soybean products, poultry without fat and skin, and fish.

Use lean red meat in moderation.

Avoid organ meats and foods with high cholesterol content.

Nuts and seeds: one serving a day
Spread on top of rice or mixed in drinks and dishes
Carried in a small box as snacks.
Not to sweeten and salt nuts and seeds.

References

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