



IMAGE AWARENESS

WELLNESS INSTITUTE

HIGH BLOOD PRESSURE

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September 2022

Volume 18: Issue 3

INTRODUCTION

Hypertension or high blood pressure is a common condition in which excessive pressure builds up in the circulatory system. Blood pressure is measured by two numbers. A higher number, called the systolic, is placed over a lower number, the diastolic. The unit of measure is millimeters of mercury.

A normal blood pressure is less than 120/80. Elevated is 120-129/80. Stage 1 hypertension is 130-139/80-89. Stage 2 hypertension is over 140/over 90. A hypertension crisis is considered to be a measurement greater than 180/120.

There are two types of high blood pressure. Essential is a term used when the cause is not clear. This term is used to describe over 90% of all cases of hypertension. Secondary hypertension is a term used when the cause of the elevated blood pressure is identified. The most common causes of secondary hypertension are kidney disease, pregnancy, and effects of medications and birth control pills.

The first medical line of treatment for high blood pressure is diuretics. They cause the body to lose water lowering blood pressure. These medications can contribute to deficiencies of potassium and magnesium. The potassium is often supplemented while magnesium is often overlooked. This is a problem due to the fact that low

magnesium can contribute to high blood pressure.

REFERENCE:

<https://commons.wikimedia.org/wiki/File:BloodPressure2.jpg>

COMPLICATIONS

Elevated blood pressure can lead to many health problems. Elevated pressure in the circulatory system damages and narrows the arteries over time and contributes to lack of elasticity. Bulges can appear in the walls of the blood vessels. If these rupture they can lead to life threatening internal bleeding. This commonly happens in the aorta, the main artery that carries blood away from the heart.

Hypertension can contribute to angina or chest pain due to nar-

rowed blood vessels. It can also contribute to an irregular heart-beat. The heart can also become enlarged leading to heart failure.

Brain damage is a risk resulting from high blood pressure. Brain damage can result from strokes resulting from rupture of leaks in blood vessels, or damage can result from the formation of blood clots blocking blood flow. Damage to the brain can result in mild cognitive impairment or full blown dementia.

Hypertension can also lead to kidney damage or kidney failure. This can result in fluid accumulation further worsening a case of high blood pressure. High blood pressure can also result in damage to the eyes including retinopathy, bleeding in the eye, blurred vision, and blindness. It can also result in erectile dysfunction in men.

DASH DIET

High blood pressure is strongly associated with a poor diet. The most commonly recommended diet is called the DASH diet (Dietary Approaches to Stop Hypertension). This diet focuses on avoiding refined grains, sugar, salt, and red meat. Participants are encouraged to consume whole grains, fruits, vegetables, nuts, seeds, chicken and fish.

Of particular benefit berries and greens are often mentioned. These foods are contributors to healthy nitric oxide formation which works to





dilate the blood vessels. Greens contain nitrates while nuts and chocolate contain arginine. All of these foods are precursors to nitric oxide which dilates and relaxes blood vessels. Berries and pomegranate have a protective effect on nitric oxide prolonging the short life of the molecule and thus improving blood flow.

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MINERAL CAUSES

High blood pressure can have many causes or contributors. Among the causes are poor diet, toxic exposures, lack of exercise, stress, aging, sleep apnea and weight gain, and nutrient deficiencies.

Sodium and Potassium

Excessive sodium intake has long been considered a contributor to high blood pressure. Recent observations suggest that sodium creates problems when other nutrients are missing or unbalanced and when the inner lining of the blood vessels is not healthy.

The ratio of sodium to potassium is of particular importance since the two nutrients are inversely related. In other words, a high intake of sodium can lead to elimination of potassium and a high intake of potassium can lead to loss of sodium.

There is little doubt that a percentage (about 50%) of those with hypertension are salt sensitive and see elevations in blood pressure when excessive salt is consumed. One contributing factor is a diet insufficiently supplied with potassium or overloaded with foods with a high sodium content.

A group of 98 vegetarians was compared with a matched group of non-vegetarians with similar salt intake. The average blood pressure of the vegetarians was 126/77 while that of the non-vegetarians was 147/88. Only 2% of the vegetarians had hypertension while 26% of the non-vegetarians had high blood pressure. The researchers noted that the potassium intake of the vegetarians was much higher. Several studies have found an inverse association between blood pressure and the ratio of potassium to sodium in the diet.

Calcium

An observational study of 7,000 Japanese men in 1989 found an inverse association between intake of both calcium and potassium and high blood pressure. The combined effect of the two nutrients was greater than either individually.

Hard water is usually associated with its content of calcium and magnesium. Hard water drinkers almost always have lower blood pressure than those who drink soft water. This is usually attributed to the increased intake of easily available calcium and magnesium in hard water.

David McCarron suggests that dietary intake of calcium is the most consistent nutritional correlate to high blood pressure in the United States. Low intake of calcium increases the risk of hypertension. A number of studies suggest that low calcium intake may be as important as high intake of sodium for regulation of blood pressure. Calcium promotes the excretion of sodium from the body.

Magnesium

Magnesium is important to con-

sider in cases of hypertension for several reasons. Magnesium is a potent dilator of the blood vessels. Magnesium deficiency often results in high blood pressure reversible by supplementation with the mineral.

Use of diuretics can deplete magnesium and worsen high blood pressure. As pointed out earlier, replenishment with the mineral is often overlooked when diuretics are prescribed. Studies have also shown that patients low in magnesium use more blood pressure medications than those with adequate magnesium intake.

Magnesium deficiency also results in a loss of potassium within cells creating an apparent deficiency of both minerals.

Calcium and magnesium work well together. Supplementation with calcium without magnesium can lead to magnesium depletion with a wide range of harmful effects.

Vitamin D

Vitamin D is necessary for calcium absorption and is essential for proper calcium and magnesium metabolism. Blood levels below 30 ng/ml are associated with high blood pressure.

Vitamin D not only plays a role in mineral metabolism, but it also regulates blood sugar. Weight gain and diabetes are associated with high blood pressure. Studies have shown that vitamin D improves insulin functioning, lowering blood sugars and helping prevent weight gain and diabetes.

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TOXIC METALS

Heavy metals like arsenic, cadmium, lead, and mercury can damage the kidneys leading to fluid accumulation and high blood pressure.

Smoking has been identified as a risk factor for high blood pressure. Cigarette smoke contains cadmium. Zinc tends to reduce cadmium levels and may provide protection from hypertension associated with cadmium exposure.

Calcium, zinc, and vitamin C have been shown to reduce lead toxicity. Lead is a common pollutant due to the fact that leaded gasoline was used for

years and lead was also added to paint.

Mercury is another toxic metal found in seafood and used as a dental filling material. Selenium provides protection from mercury and low levels of selenium have been associated with elevated blood pressure.

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SUGARS

Salt and sugar tend to increase appetite Paula Geisselman discovered long ago that both of these substances caused rabbits to eat much more food. Not only do these foods make us eat more, but they also have the ability to increase blood pressure and may even have synergistic effects.

Excessive intake of glucose tends to lead to insulin resistance which is associated with higher blood pressure.

The role of fructose is a bit more complex. Excessive consumption of fructose sweetened beverages (60-200 grams a day) can cause a rapid increase in blood pressure. High-fructose diets have been used for decades to generate models of hypertension and insulin resistance in animals.

Fructose increases salt absorption so a combination of the two is particularly detrimental. The combination of salt and fructose is worse than either separately. Fructose may also inhibit the excretion of salt.

High levels of fructose can also damage the lining of the blood vessels. Sugars attach to the inner lining of the blood vessels decreasing flexibility. When glucose is involved, this is called glycosylation. Fructose causes similar damage called fructosylation.

Fructose also stimulates the sym-

pathetic nervous system which tends to make blood vessels contract rather than relax. This is the last thing one wants to happen when blood pressure is high.

Nitric oxide is an important promoter of dilation of the blood vessels. The combination of high levels of insulin with fructose can dramatically reduce nitric oxide production increasing blood pressure.

Fructose also metabolizes to uric acid which can increase blood pressure on its own. Glucose does not metabolize to uric acid and is not a major risk factor in increasing uric acid levels, but it can contribute to insulin resistance.

Other dietary factors can contribute to elevated uric acid. Alcohol consumption, including beer, and red meats can play a role in increasing uric acid in the body.

Allopurinol, a medication used to reduce levels of uric acid can minimize uric acid induced hypertension. The good news is that researchers have discovered that vitamin C can lower uric acid levels possibly reducing the risk of gout. In a similar manner, it should reduce the risk of high blood pressure caused by bad dietary habits which increase uric acid levels. Vitamin C has been recommended as

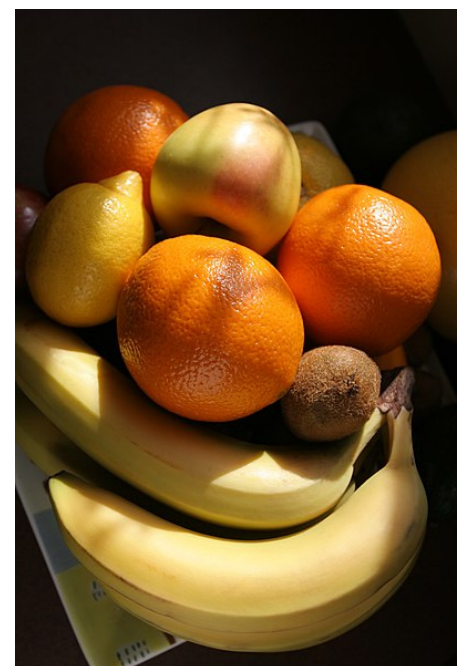




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an agent for lowering blood pressure. Flavonoids and polyphenols which are associated with vitamin C in nature have also been suggested as adjuncts for lowering blood pressure.

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OTHER FACTORS

CoQ10

A number of other nutrients may also be effective in preventing high blood pressure. Coenzyme Q10 (CoQ10) is a powerful agent in lowering blood pressure. Researchers suggest that this nutrient reduces oxidative stress in the blood vessels and promotes vasodilation.

The blood level of the nutrient had to exceed 2 mcg/ml in the blood to be effective and different levels of supplementation were required to achieve this level in different patients.

Omega-3 Fats

Inflammation in the circulatory system contributes to elevated blood pressure. It should not be surprising that fish oils have been shown to reduce blood pressure. It is a good idea to supplement with vitamin E and/or carotenoids with fish oils as this will prevent the fish oils from oxidizing within the human body which could negate the beneficial anti-inflammatory effects of omega-3 fats. In one study, long term supplementation of patients with high triglycerides resulted in significant declines in both systolic and diastolic blood pressure.

Food Sensitivity

A study published in the British medical journal *Lancet* in 1979 reported that food sensitivities were associated with elevated blood pressure. The researchers were attempting to treat migraine but 25% of the patients who removed foods from the diet to which they were sensitive experienced drops in blood pressure.

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