

Conservative Treatment Options for the Hypertensive Patient

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Abstract

Objective: The purpose of this literature review is to compile the most recent literature regarding the conservative treatment options for hypertension. This review will discuss the effects of chiropractic care along with acupuncture and other holistic methods of care. It will also discuss the effects of nutritional management, exercise, and herbal remedies and how they have been used to manage hypertensive patients. Special attention will be paid to nutritional and supplemental therapies.

Data Collection: The resources utilized included indexed/referenced journal articles, text and reference books, as well as internet websites. Pubmed, Ebscohost, Chiroweb, Chiroaccess and Mantis were databases used to find journal articles and publications related to conservative treatment options of hypertension. The Mobius library catalog was utilized at the Learning Resource Center of Logan University to find books related to non-pharmacologic interventions for hypertension.

Results: The keywords hypertension, spinal manipulation, nutrition, exercise, and herbal remedies turned up thousands of articles, some of which were beyond the scope of this literature review. The most relevant articles were chosen and included in this compilation. The following discourse represents the four most common and effective non-pharmacologic interventions for hypertension management.

Conclusion: Current wisdom indicates that diet is the most important issue in managing hypertension. A drastic reduction in sodium intake is a major component in reducing blood pressure. Increasing olive oil consumption, potassium, calcium, magnesium, folate, and garlic are all beneficial dietary components for patients with hypertension. Exercise is also an effective option in promoting cardiovascular health. It is important to note that this review found that

aerobic exercise is not the only form of exercise that can be beneficial in lowering blood pressure. Tai chi and isometric exercise have been found to provide some benefit. A healthy nervous system is essential in maintaining good health and chiropractic care has been found to provide some benefit to these patients as well. There are also many new and innovative techniques that have proven to combat the effects of hypertension. Overall, anyone intending to manage hypertension conservatively should employ all of these interventions, which can only be beneficial.

Key Words: Hypertension, high blood pressure, nutrition, exercise, chiropractic, herbal remedies, manipulation, adjustments.

Introduction

Hypertension, otherwise known as high blood pressure, is defined as an elevated pressure of the blood in the arteries. This pressure is controlled by many organs in the body as well as many of the body systems. Blood pressure is measured by using two numbers derived from two pressures of the heart: the Systolic pressure (the pressure as the heart contracts), and the Diastolic pressure (the pressure as the heart relaxes).(1) Presently, the most common types of medical treatment for hypertension involve the use of diuretics, calcium channel blockers, ACE inhibitors, and nonsteroidal anti-inflammatory drugs (NSAIDS) to name a few.(2) While these treatments often relieve the symptoms of hypertension, they can cause serious side effects and complications. New conservative approaches are needed not only to increase the safety of treatment, but also to alter the course of the disease. The DASH diet and other nutritional, supplemental, and lifestyle changes are a great optional conservative way to lower blood pressure so there are no toxic effects like in drug therapy.(3) Exercise and natural herbal remedies also show a positive effect toward lowering blood pressure.(4)

This literature review will discuss the problems that people with hypertension may face and the complications that also arise. However, it will focus mainly on the various conservative treatment options available to help lower high blood pressure.

Hypertension affects one fourth of the adult population (50 million in the US and 1 billion worldwide).(5) It is present in 54% of people aged 65-74 and is even higher in the black population.(6) Some complications that may arise due to a high blood pressure include stroke, myocardial infarction, heart failure, peripheral vascular disease, aortic dissection, and chronic renal failure. There are two general categories of hypertension: Primary (essential) and Secondary. 90-95% of hypertension is idiopathic (there is no known cause) and Primary. Of the

remaining 5-10%, it is usually Secondary due to kidney disease or atherosclerosis (a buildup of plaque on the arterial wall).(7) Hypertension results from factors such as the heart pumping blood with too much force or the arterioles (smaller vessels) narrowing and causing an increased pressure against the vessel wall. Vascular injury can occur in the heart, kidneys, brain, and the eyes due to this increased pressure in the blood vessels.(8)

Normal blood pressure has a systolic pressure reading somewhere below but close to 120mm Hg and a diastolic pressure below 80mm Hg. Hypertension is categorized into three separate divisions: Prehypertension, Mild Hypertension, and Moderate to Severe Hypertension. Prehypertension is a pressure reading of systolic 120-139mm Hg and diastolic 80-89mm Hg; Mild Hypertension is a reading of systolic 140-159mm Hg and diastolic 90-99mm Hg; and Moderate to Severe Hypertension is categorized as a systolic pressure over 160mm Hg and diastolic over 100mm Hg.(5)

Hypertension may arise from such factors as smoking, alcohol abuse, obesity, a high salt intake, lack of exercise, and stress. Arteriosclerosis (thickening, hardening, and narrowing of the artery wall) and having a genetic predisposition (family history of hypertension or stroke) can also be factors. Hypertension has been referred to as a "Silent Killer" because there are no symptoms caused by it. If the patient is experiencing any symptoms they are usually due to some other cause and not the disease itself.(1)

Current medical treatment methods for hypertension tend to deal with only the symptomatic relief and not the physiology behind the disease. These treatments have been shown to have harmful toxic side effects on the human body. Although this disease is usually considered a medical problem to most people, there are many people willing to try conservative methods to treating hypertension.(9) Recent studies have determined that exercise can have a positive effect

on lowering blood pressure. Even patients on medications can benefit from a small amount of physical activity.(10) Spinal manipulation as a treatment with a diet for lowering blood pressure has also proven successful in lowering blood pressure.(11) Nutritional and supplemental options to lower blood pressure include a restriction of Sodium and an increase in Calcium, Omega-3 fatty acids, Prostaglandins, Potassium, Coenzyme Q10, and Vitamin E, along with weight reduction (if necessary).(13) Natural Herbal remedies such as High-Rite and Aqua-Rite are also a great way to conservatively treat hypertension.(1) A popular diet system used to lower blood pressure is known as the DASH eating plan which will be discussed later in detail.(12)

The purpose of this paper is to review the literature presented on the topic of hypertension and the conservative methods of management and treatment of the disease. It is the intent of this review to investigate and raise the awareness of the potential benefits of exercise, nutritional modifications, spinal manipulations, supplements, and the use of herbal remedies in the treatment of hypertension. This paper will review literature regarding exercise, nutrition, supplementation, and herbal remedies and their role in the treatment of hypertension. An overview including current studies and the effects of each type of conservative treatment will be assessed also.

Discussion:

Exercise and Hypertension

Exercise has many positive effects on blood pressure. Regular exercise keeps arteries elastic in any aged individual. It also maintains a normal blood flow and pressure. However, high intensity exercise may not lower blood pressure as effectively. Moderate exercise should only be recommended for a hypertensive individual.(4) There are many different types of conservative and alternative treatments believed to be effective for treating hypertension. Some scientific evidence indicated that increased physical activity and regular practice of stress management and relaxation techniques such as yoga, Tai Chi, or Qigong will help to lower high blood pressure.

Obesity is another risk factor for hypertension which may cause some complications in a patient. A reduction in weight should always be a part of the treatment plan for a hypertensive patient. Moderate exercise is recommended for safely lowering blood pressure. A recent study determined that physical activity contributes to controlling blood pressure in obese and lean individuals. It observed that after ten weeks of moderate exercise, that there was a lowered diastolic pressure among pregnant women who were at risk for hypertension. It also stated that people on medications for hypertension can also benefit from moderate exercise.(10) Fifteen studies from English literature stated results that exercise decreased blood pressure in about 75% of hypertensive patients with a systolic and diastolic reduction of 11mm Hg and 8mm Hg respectively. Women may reduce more than men and middle-aged people more than younger or older people.(4) A recent study revealed that men and women of all age groups who are physically active have a decreased risk of developing hypertension. Findings from multiple

studies indicate that exercise can lower blood pressure as much as some drugs can. People with mild and moderately elevated blood pressure who exercise 30 to 60 minutes three to four days per week (walking, jogging, cycling or a combination) may be able to significantly decrease their blood pressure. Blood pressure increases when a person is under any type of stress, whether it be emotional or physical, but it is not yet clear whether or not psychological treatments aimed at stress reduction can decrease blood pressure in patients with hypertension. Nevertheless, recent studies suggest that ancient relaxation methods that include controlled breathing and gentle physical activity, such as yoga, Qigong, and Tai Chi, are beneficial. People with mild hypertension who practiced these healing techniques daily for two to three months experienced significant decreases in their blood pressure, had lower levels of stress hormones, and were less anxious. A 20-year study of people taking medications to treat hypertension revealed that the blood pressure in those who practiced qi gong for 30 minutes two times per day remained stable while the blood pressure progressively worsened in those who did not practice qi gong regularly.(14) The results of another recent small study suggest that a daily practice of slow breathing (15 minutes a day for 8 weeks) brought about a substantial reduction in blood pressure. However, these findings have not been officially confirmed and it might take some time before these ancient healing techniques are recommended as effective alternative approaches to treating hypertension. Still, these pose many possible benefits with minimal risks, therefore making these gentle practices a worthwhile activity to incorporate into a healthy lifestyle.(15) According to several large-scale, population-based studies, obesity is one of the strongest predictors of the development of high blood pressure in adolescents and young adults, therefore, maintaining a normal body weight is one of the most effective ways to prevent high blood pressure. Weight reduction, in overweight individuals of any age should be a top priority in the

prevention of hypertension.

Nutrition/Supplementation and Hypertension

The DASH (Dietary Approaches to Stop Hypertension) eating plan is one of many effective ways to manage nutrition in a hypertensive patient. It is an eating plan that is low in saturated fat, cholesterol, and total fat, and it emphasizes fruits, vegetables, and low fat dairy food. This plan also includes whole grain products, fish, poultry, and nuts. It is reduced in red meat, sweets, and sugar-containing beverages and is rich in magnesium, potassium, and calcium, as well as protein and fiber. It also includes a reduction in dietary sodium. This plan has statistically proven to reduce blood pressure within two weeks of starting it.(12)

Potassium has shown to lower blood pressure while keeping it in control at the same time. It has been proven to release Nitric Oxide via the vascular system in the body. Nitric Oxide induces vasodilation and a decrease in platelet aggregation resulting in a lower pressure in the vessels and protection against hypertension-induced injury.(16) Magnesium has also been linked with high blood pressure. These levels tend to be low in the hypertensive patient and need to be retained by some sort of nutrition or supplementation. Calcium is an important nutrient for overall good health but has also demonstrated a blood pressure lowering effect.(3) Coenzyme Q10 is a common supplement that is used in the prevention and treatment of hypertension. It prevents the oxidation of LDL (low-density lipoprotein) cholesterol (bad cholesterol) that can lead to atherosclerosis.(17) Coenzyme Q10 along with Vitamin E and Vitamin C are antioxidants and

Q10 is a common supplement that is used in the prevention and treatment of hypertension. It prevents the oxidation of LDL (low-density lipoprotein) cholesterol (bad cholesterol) that can lead to atherosclerosis.(17) Coenzyme Q10 along with Vitamin E and Vitamin C are antioxidants and oxidate LDL. Vitamin E will also reduce coronary artery blockage by decreasing blood platelet aggregation.(18) One study demonstrated that Vitamin C, Vitamin E, and Coenzyme Q10 have antioxidant effects such as oxidation of LDL (bad cholesterol). Vitamin E also reduces coronary artery blockage by decreasing blood platelet aggregation.(18) Omega-3 fatty acids (fish oil) is also an effective supplement for lowering blood pressure as well. Although population-based studies suggest a link between salt intake and prevalence of high blood pressure in particular groups of people such as African Americans, how each individual responds to sodium in his or her diet is very different. Since reducing dietary salt is generally considered safe, low-salt diets are recommended, especially for those at risk for developing hypertension or heart disease.

The DASH experiment compared three eating plans: one similar to the normal American consumption, one like the first but higher in fruits and vegetables, and then the DASH plan. Each contained about 3,000mg of Sodium daily. None were vegetarians or used specialty foods. The results showed that both the DASH plan and the increased fruits and vegetables plan reduced blood pressure. However, the DASH plan had the greatest effect, especially for those with high blood pressure. These reductions in blood pressure came within two weeks also. Another study called the "DASH Sodium" study looked at Sodium and its effect on blood pressure if it was reduced in a diet. This involved 112 participants, about 41% of them had high blood pressure. They were randomly assigned to one of the two eating plans that lowered blood pressure in the first experiment and were followed for a month at three different Sodium levels: 3300mg/day,

2400mg/day, and 1500mg/day. The results showed a reduction in blood pressure in both plans with the biggest reduction coming from the intake of 1500mg/day. However, each individual showed large decreases in blood pressure.(12)

One study documented the effects of Omega-3 fatty acids (fish oil) on people at risk for hypertension. 120 men were randomly allocated to five high-fat and two low-fat groups and set on a twelve week dietary intervention period involving Omega-3 fatty acids. The five high-fat groups were assigned to take either 6 or 12 fish oil capsules daily, fish, or a combination of fish oil and fish, or placebo capsules. The low-fat groups took either fish or placebo capsules. The results showed a greater fall in both systolic and diastolic blood pressures in subjects allocated fish or fish oil, more so in the low-fat groups compared to the control subjects.(19)

A new study has suggested that replacing a small amount of carbohydrates in an already heart-healthy diet for either protein-rich foods or unsaturated fats may provide additional benefits in lowering hypertension. However, the question remains which protein or carbohydrate to emphasize the most.(20) Some studies suggest that people who consume three or more alcoholic beverages per day increase their risk for developing hypertension. Therefore, if an individual is going to drink alcohol, their intake should be limited to no more than two drinks per day.

An ideal diet would be one that is designed specifically for a patient. However, in general, an anti hypertension diet should include all essential nutrients, be rich in fiber, high in potassium, and from vegetables, fruits, legumes, whole grains, low fat dairy or dairy substitutes fortified to match the nutritional profile of dairy, low in sodium and saturated fat, with total fat from monounsaturated and polyunsaturated sources totaling 30% of calories, and conducive to weight loss. Such a diet supports the 1997 recommendations of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. This

diet, which was rigorously evaluated in the Dietary Approaches to Stop Hypertension (DASH) clinical trial, substantially lowered blood pressure in normotensive and hypertensive individuals.(12) The association of a high sodium diet and high blood pressure has been established. Therefore, there is a strong incentive to reduce dietary sodium levels. In the December 1, 1999 issue of the Journal of the American Medical Association, researchers studied the relationship between dietary sodium and cardiovascular disease risk in overweight and non-overweight individuals. They concluded that high sodium intake is strongly and independently associated with an increased risk of cardiovascular disease and all can cause mortality in overweight individuals. However, remember that we are all biochemically unique, and that each person may handle food in a different way, what is beneficial to some may be harmful to others. It is important to consult a certified nutritionist to design an individualized diet. About ten years ago, the department of medicine at Mt. Sinai Hospital and Medical Center in New York reported in the Journal of Clinical Pharmacology that the importance of weight control and nutrition as it relates to cardiovascular disease is now being realized in clinical trials worldwide. In humans, a deficiency of coenzyme Q10 (CoQ10) was found in 39% of patients with hypertension, compared to 6% of those with normal blood pressure. Providing these patients with 60 mg of CoQ10 for eight weeks resulted in a 10% or greater decrease in blood pressure. In a double blind study, 20 hypertensive subjects with low serum levels receiving 100 mg of CoQ10 per day for 12 weeks, showed a significant reduction in systolic and diastolic blood pressure. In a 1994 study, 109 patients with known hypertension were given 225 mg of CoQ10 daily, achieving a serum level of at least 2 mcg/ml. There was a decrease in systolic blood pressure from an average of 159 mmHg to 147 mmHg, while mean diastolic pressures dropped from 94 to 85 mmHg. From this treatment, fifty percent of patients were able to

decrease or eliminate their medication. The physiologic mechanism for this reduction in blood pressure is not yet fully understood. However, in 1990, Digiesi and Cantini demonstrated a decrease in resistance of blood vessel walls. Furthermore, clinical cardiologist Stephen Sinatra, MD, FACC, believes this action may be secondary to an improvement in the metabolic function of the cells, and that the antioxidant properties of CoQ10 may help normalize cellular chemistry and promote optimal tone and compliance of the elastic vessel walls.(16) At the division of Hypertension and Nephrology, National Cardiovascular Center, Suita, Osaka, Japan, a study was conducted on the effects of supplementation on office, home, and ambulatory blood pressure in patients with essential hypertension. Sixty untreated or treated patients (34 men and 26 women, aged 33 to 74 years) with office blood pressure greater than 140/90 mmHg were assigned to an 8-week supplementation period (400 mg), or an 8-week control period in a randomized crossover design. All of the blood pressures were lower during the supplemented period than in the control period. The results indicate that supplementation lowers blood pressure in hypertensive subjects, and this effect is greater in subjects with higher blood pressure.(1)

Herbal Remedies and Hypertension

Some herbal remedies such as High-Rite and Aqua-Rite have also been proven helpful in lowering blood pressure. The effects that they may have are of increased energy levels and feelings of well being, reduced blood pressure, toning and protecting the heart and cardiovascular system, improving circulation, improving heart pumping ability, improving blood flow, calm and soothe stress, relieve angina (chest pain), and protect against dangerous plaque

build up in the coronary artery and help to prevent blood clotting, strokes, and heart attack.(12)

Garlic also has a mild blood pressure lowering effect. Forty-seven non-hospitalized patients with mild hypertension took part in a randomized, placebo-controlled, double-blind trial conducted by 11 general practitioners. The patients who were admitted had diastolic blood pressures between 95 and 104 mmHg. The patients then took either a preparation of garlic powder (Kwai) or a placebo of identical appearance for 12 weeks. Significant differences between the placebo and the garlic group were found during the course of therapy. For example, the diastolic blood pressure in the group having garlic treatment fell from 102 to 91 mmHg after eight weeks, and to 89 mmHg after twelve weeks. Serum cholesterol and triglycerides were also significantly reduced after eight and twelve weeks of treatment. In the placebo group, on the other hand, no significant changes occurred.(20)

Crataegus oxycantha may have a mild blood pressure lowering effect. According to studies, it may dilate coronary vessels, inhibit angiotensin-converting enzyme, increase the functional capacity of the heart, and possess mild diuretic activity. The herb *Coleus Forskohlii* has a long of use in Ayurvedic systems of medicine. Its primary active chemical component, forskolin, was discovered in 1974 by the Indian Central Drug Research Institute. Possible cardiovascular effects of the herb *Coleus Forskohlii* involve the lowering of blood pressure by increasing cAMP levels throughout the cardiovascular system, which results in relaxation of the arteries. Studies on Forskolin show that it may cause the activation of an enzyme called adenylate cyclase, which increases the amount of an important cell regulating chemical called cAMP (cyclic adenosine monophosphate) in cells.(12) Normally, a stimulatory hormone, such as adrenaline (epinephrine) binds to a receptor site on a cell membrane and stimulates the activation of adenylate cyclase.(7) However, it has been postulated that forskolin bypasses this need for

direct hormonal activation, and as a result cAMP cellular levels rise. Such an increase in cAMP can result in relaxation of the arteries and other smooth muscles. Further studies have demonstrated its blood pressure lowering characteristics.(12)

Animal studies regarding a dietary mushroom called Maitake (*Grifola frondosa*) have shown powerful effects for lowering blood pressure and cholesterol. After a cursory review of some studies, the Department of Medicine, Memorial Sloan-Kettering Center, in New York, called for further epidemiological evidence of the role of this functional food class (edible mushrooms). They concluded that *Grifola* (Maitake) mushrooms have various degrees of immunomodulatory, lipid-lowering, antitumor, and other beneficial or therapeutic health effects without any significant toxicity.(21)

Chiropractic/alternative treatments and Hypertension

Preliminary evidence suggests that people with high blood pressure who receive chiropractic spinal manipulation experience a significant reduction in blood pressure, but more research is needed to confirm its use for hypertension. In fact, on rare occasions, a spinal manipulation session may actually cause extremely low blood pressure leading to dizziness or lightheadedness.(14) Extensive research on the effectiveness of acupuncture for lowering blood pressure has been reported, but many of these studies have considerable weaknesses. More detailed and controlled research is needed to determine the value of acupuncture as a treatment for hypertension. However, several studies involving small numbers of people with hypertension have shown a reduction in blood pressure with the use of acupuncture. While most of these clinical trials were conducted over a short period of time, the results suggest that it would be

beneficial for scientists to conduct a more in depth research of acupuncture for treating high blood pressure.(15) A bioelectric treatment model at reducing hypertension has also been proven effective. The main concept behind this form of therapy is that the bioelectricity of human body is parallel to that of human blood pressure and when the bioelectricity is balanced, blood pressure becomes normal. Massage may also be a worthwhile therapy for people with hypertension brought on by stress. This is because the beneficial effects of massage are due at least in part to a reduction in stress. One recent study revealed that people with hypertension who receive massage showed significant reductions in blood pressure and steroid hormones, an indicator of stress.(20) Although more studies are needed to evaluate the long-term safety and effectiveness of massage, people with hypertension who tend to have high levels of stress in their lives may benefit from massage therapy. In addition, massage tends to help people stick with healthy behaviors such as eating healthfully and not smoking. Although the association between ongoing life stress and hypertension is complex and somewhat controversial, many believe that relaxation techniques may be helpful in alleviating feelings of stress, which is often a contributing factor to hypertension. While the results of studies investigating this relationship have been mixed, one study of older African Americans living in an urban setting found that those who participated in a transcendental meditation (TM) or progressive muscle relaxation (PMR) program had a significant reduction in blood pressure compared to those who participated in a lifestyle education program. While both techniques were beneficial, TM was twice as effective as PMR. In addition to TM and PMR, other mind/body techniques such as self-hypnosis and biofeedback have shown promising results in recent studies. Biofeedback in particular may reduce elevated blood pressure from stress and help individuals achieve healthful lifestyle modifications, such as stopping smoking and losing weight.(14)

Conclusion

Many conservative treatments and lifestyle changes are available for the hypertensive patient to try to lower blood pressure and reduce their risk of disease in place of the current medical treatment that is out there. Whether it be exercise, the DASH eating plan, herbal remedies, dietary supplements, or all of them, conservative treatment methods should be applied first and possibly for the entire treatment plan so that the patient doesn't have to put up with the grueling side effects present in current medicinal drug therapies. The goal in treating hypertension is to reduce the risk of serious complications, including heart disease and stroke. While the optimum blood pressure is 120/80 mm Hg, even partial reduction in blood pressure is beneficial. Diet, exercise, and relaxation are necessary with or without medications. In fact, a National Institute of Health (NIH) statement issued in 1996 asserts that behavioral and relaxation therapies must be integrated into conventional medical treatment of high blood pressure.

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