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Antihypertensive Herbal Remedies: A Review

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Abstract: Hypertension and atherosclerosis are the predominant sources of cardiac illness worldwide. Apart from taking medicine, additional adjustments to diet and the utilization of herbaceous plants are important for addressing high blood pressure and atherosclerosis. Further drugs can be effective in controlling the elevation of blood pressure in patients. This article reviews herbal remedies to deal with high blood pressure, as well as examines the habits and diets that might help decreasing the severity of this condition. Hypertension is generally not characterized by signs or symptoms, but it can be very damaging for heart health. Among these habits, the DASH diet is a helpful approach for minimizing hypertension, while, from the plant world, several species have been regarded as having antihypertensive entities, such as Sesamum indicum, Rauwolfia serpentine, Raphanus sativus, Phyllanthus amarus, Linum usitatissimum, Lepidium latifolium, Desmodium styracifolium, Coleus forskohlii, Cassia occidentalis and Cassia absus. The benefits of each of these herbs and the chances of them offering an alternate to medicine for hypertension are described in this article.

Index Terms - Hypertension, atherosclerosis, blood pressure, herbal remedies, antihypertensive.

I. INTRODUCTION

High blood pressure and atherosclerosis are common causes of heart disease. Hypertension has become one of the most treatable yet preventable diseases of the 21st century[1]. High blood pressure often has no symptoms and can be easily detected, which is why it is called the silent killer. The National Institutes of Health classifies high blood pressure as systolic blood pressure greater than 140 mmHg or diastolic blood pressure greater than 90 mmHg[2]. Many factors can increase the risk of high blood pressure, including stress, a high-salt diet, family history, obesity and excessive alcohol consumption. Some chronic conditions, such as kidney disease, diabetes, and sleep apnea, may also increase the risk of high blood pressure[3]. High blood pressure is a chronic and often asymptomatic disease in which blood pressure is higher than normal. Therefore, the heart has to work hard to overcome the force of the force to send blood to the tissues, causing stress on the heart and blood vessels. Over time, excessive stress can lead to heart failure and is the leading cause of heart failure (myocardial infarction, pulmonary embolism, brain aneurysms, and kidney failure)[4]. The doctor's first recommendation is usually for the patient to make some lifestyle changes before taking the medication. There is now a way to eat to control high blood pressure (DASH) diet. This is not recommended by doctors as a way to reduce the risk fate of high blood pressure and focus only on reducing. salt intake The importance of limiting dietary fat, cholesterol and total fat intake. Promotes a diet rich in vitamins and minerals, fruits and vegetables, low- fat and low-fat foods, lean meat and poultry, as well as nuts, seeds and legumes[5]. Natural products derived from plants, animals and food have always formed the basis of the treatment of human diseases. Today, it is estimated that approximately 80% of people in developing countries still turn to traditional medicine for medical treatment, primarily derived from plants and animals, for the first time. Medicinal plants are now in high demand and their popularity is increasing day by day. Approximately 500 plants with medicinal uses are mentioned in ancient texts, and around 800 plants are used in indigenous medicine. India has a large reserve of medicinal plants used in traditional medicine[6]. Demand for Ayurvedic botanical medicine has increased in Western countries as allopathic medicine has more side effects. Many pharmaceutical companies are now focusing on the production of herbal and herbal medicines[7].

II. NATURAL HERBS-

Sesamum indicum:

Alcoholic extracts of the seeds (1-30 mg/kg) cause hypotension in anesthetized rats. A decrease in systolic and diastolic blood pressure was observed with the use of the drug. Studies have shown decreased HR at low doses (10-30 mg/kg). Atropine (2 mg/kg) has been reported to abolish the cardiac response, indicating the presence of acetylcholine- like receptors in the brain. Sesamin and sesaminol are the main phenolic components of sesame oil. A study in hypertensive patients showed that consumption of sesame oil increased glutathione peroxidase, superoxide dismutase and catalase activities while reducing oxidative stress. These results support the hypothesis that consuming sesame oil may help increase antioxidant activity in humans. Researchers have found sesamin to be an effective protection against high blood pressure and cardiac hypertrophy[8].

Rauwolfia serpentine:

It is a perennial tree native to Asia, South America and Africa. Extracts from different and similar plants are used in Indian medicine to treat snake bites, insomnia, insanity and many other ailments. It is considered the most powerful herb in lowering blood pressure. Reserpine is a purified alkaloid of R. Serpentine is the first long-term treatment for high blood pressure. Only a small dose is enough to be successful and avoid side effects. Nasal congestion is the most common cause. Reserpine was marketed in 1952 as Serpasil for the treatment of hypertension, tachycardia, and thyrotoxicosis. Combinations of reserpine, dihydroergometrine and diuretics are currently on the market (Brinerdin, Crystepin)[9].

Raphanus sativus:

This plant has been shown to have anti- inflammatory properties. During a 24-hour acute toxicity study in rats, tissue preparations were suspended in tissue baths containing Krebs solution. This extract caused a drug-induced (0.1-3 mg/kg) decrease in blood pressure and heart rate in atropine-sensitive method-treated rats. found a dose-dependent (0.03-3.0 mg/ml) inhibition of contractility and velocity in isolated guinea pig atria. In tissues treated with atropine, inhibitory effects are abolished and stimulatory effects of the heart that are resistant to adrenergic and serotonin receptor blockade are revealed. In endothelial rat aortas, it inhibits phenylephrine-induced contractions, which are blocked by atropine. The extract is safe in mice at doses up to 10 g/kg. Studies have shown that the cardiovascular inhibitory effect of the plant is by activating muscarinic receptors, so it is possible to justify its use in hypertension[10].

Phyllanthus amarus:

This plant is used in traditional medicine as a diuretic and lowers blood pressure. Amaechina and O mogbai reported that intravenous administration of plant leaf extract (5–80 mg/kg) to anesthetized NMT male rabbits resulted in a reduction in diastolic, systolic, and mean arterial pressure in response to grade level. The 5 mg/kg dose caused the least hypotensive effect, and the 80 mg/kg dose caused a decrease of 13.3 ± 3.1, 19.7 ± 5.4 and 14.3 ± 3.4 mmHg in diastolic, systolic and mean arterial pressure, respectively. caused. kg drug makes 5 mg/kg. It has less blood pressure lowering effect. kg caused the largest decrease in diastolic BP, systolic BP, and mean arterial BP, with 49.7 ± 7.9, 45.5 ± 9.5, and 48.00 ± 6.5 mmHg, respectively. The preventive effect of this extract on diastolic blood pressure is greater than on systolic blood pressure[11].

Linum usitatissimum:

It is an annual plant believed to originate from Egypt. Flaxseeds and oil are rich in alpha- linolenic acid, an essential fatty acid that is beneficial for heart diseases, gastrointestinal diseases, arthritis and other health problems. Alpha- linolenic acid belongs to a group of substances called omega-3 fatty acids. Many studies have shown that eating a diet rich in omega-3 fatty acids can lower blood pressure in people with high blood pressure. Flaxseed may prevent atherosclerotic heart disease through several mechanisms, including reducing cholesterol, platelet aggregation, and inflammatory markers; improving blood sugar tolerance; and acts as an antioxidant. Consuming 15 to 50 grams of ground flaxseeds per day lowers total cholesterol and LDL concentrations without changing triglycerides or HDL cholesterol[12].

Lepidium latifolium:

This plant is used as a folk remedy to treat kidney stones in the Canary Islands. It has been shown to have hypotensive effects in rats due to its diuretic effect. Aqueous leaf extract administered intraperitoneally and orally at doses of 50 and 100 mg/kg, respectively, produced significant diuretic and antihypertensive activities. This study was conducted to further reveal the diuretic effect of the mouse extract in humans, both with the effect of furosemide.Standard diet every day of L. latifolium in humans is 3 to 5 g/day in tea form, equivalent to 43 to 71 mg/kg per 70 kg body weight[13].

Desmodium styracifolium:

Intravenous injection of preparations consisting of dry plant leaves and stems into anesthetized dogs increases coronary circulation, lowers arterial blood pressure,slows the heart rate and reduces the oxygen consumption of the heart. Ho and colleagues investigated the cardiovascular effects of Desmodium grandiflorum (DSE) and Clematis vulgaris (CCE) aqueous extracts in rats in vivo and in vitro. In 1982, DSE produced two hypotensive effects: the first was mediated by stimulation of cholinergic receptors and the second was blockade of autonomic ganglia and alpha-adrenergic receptors. Unlike DSE, CCE is a hypotensive response mediated solely by histamine activity. In addition, both extracts isolated spiral tail artery strips preconstricted with methoxyamine. CCE also produced negative chronotropic and positive inotropic effects on isolated atria, whereas DSE showed positive chronotropic effects but no significant effect on contractility[14].

Coleus forskohlii:

The pharmacological properties of choleol, a diterpene isolated from C. forskohlii, were examined. Its main function is to lower blood pressure with sufficient energy by relaxing muscle fibers during anesthesia in cats, mice and rats. It has good inotropic effects on rabbit liver and cat liver in vivo in small doses. Coleonol also showed nonspecific activity against the muscles of various species, but not against the bronchial muscles of guinea pigs. Cornol in high doses has a depressant effect on the central nervous system[15].

Cassia occidentalis:

It is a small tree with a height of 5 to 8 m. The leaves of this plant are used in folk medicine as an antihypertensive agent. In vitro studies of the leaf extract showed a relaxing effect on the aortic annulus. Studies have shown that cassia seed extract can inhibit Ca2+ influx through receptor-based and voltage-sensitive channels, thereby relaxing soft tissue and lowering blood pressure, indicating that it is not selective for Ca2+ channels[16].

Cassia absus: This plant grows in tropical regions and can be found all over India. Intravenous administration of a crude C. absus extract has been reported to cause a dose-dependent reduction in blood pressure (1-30 mg/kg), which is accompanied by a reduction in HR at higher doses (10 and 30 mg/kg). Repeated injection of the same dose of crude extract has been shown to produce tachyphylaxis. It was reported that anesthetized animals had a decrease in blood pressure and less resistance to acetylcholine[17].

Camellia sinensis: Ingesting tea has many health advantages.Researchers are interested in the effects of tea on heart disease. Research on tea and HTN is conflicting. Studies on black tea (fermented tea) (Camellia sinensis) show no effect on blood pressure in people with high blood pressure. Population research links consumption of green tea (unfermented) (Camellia sinensis) and oolong tea (partially fermented) (Camellia sinensis) with a decreased risk of developing HTN[18].

Tropaeolum majus: Studies have confirmed that gorse is beneficial to blood vessels. Hydroethanolic extract of Nasturtium nasturtium has been shown to reduce MAP in SHR rats. Ethanol extract of T. majus (300 mg/kg), treatment drug (100 mg/kg) or isoquercetin (10 mg/kg) have diuretic properties. All of the above ingredients can reduce ACE concentrations in the blood. It increases the production of isoquercetin, an active flavonoid[19].

Carthamus tinctorius: known as Kafesheh (Persian), is widely used in Chinese medicine to treat various diseases, including cerebrovascular and cardiovascular diseases. Safflower yellow (SY) reduces blood pressure by activating KATP channels, as well as reducing renin activity and Ang II levels in the SHR. In addition to lowering blood pressure in healthy individuals, seed extract (2.1 g per day) reduced VCAM-1 and LDL levels, inhibited PDGF- induced VSMC proliferation, and reduced blood vessels[20].

Coleus forskohli: Coleus forskohlii has been used in Ayurvedicmedicine for many years. In 1974, the Central Drug Research Institute of India found that forskolin, a part of the plant, had blood pressure- lowering and antispasmodic effects. The blood pressure-lowering effect of forskolin appears to be due to relaxation of the muscles in the blood vessels. In studies on heart tissue, forskolin activated membrane-bound adenylyl cyclase and cytoplasmic cAMP-dependent protein kinase. Researchers think that the positive inotropic effect is achieved by improving the absorption of calcium by cardiomyocytes. Dithermene coleonol, another component of Coleus, has been shown to lower blood pressure in cat models[21].

Daucus carota: it's been used in conventional remedy to deal with high blood pressure. Functional level sequencing of the aerial parts of D. carota isolated two coumarin glycosides, encoded DC-2 and DC-3. Urinary administration of this drug in mice anesthetized with NMT caused a dose-dependent (1-10 mg/kg) decrease in blood pressure. In an in vitro study, both compounds produced a dose-dependent (10–200 μg/ml) inhibitory effect on guinea pig atrium beating and K + -induced contraction in the Rabbit. Aortic concentrations are similar. These results suggest that DC-2 and DC-3 may act by blocking calcium channels and that this effect may be responsible for the anti- inflammatory effects of the compounds observed in vivo[22].

Theobroma cacao: Cocoa powder is rich in flavonoids, which can be used to prevent heart disease. Flavonoids found in chocolate support nitric oxide production, increase vasodilation and reduce endothelial dysfunction. The development of alcohol research also shows that consumption of 46 to 105 grams of dark or milk chocolate (T. cocoa) per day, providing 213 to 500 mg of cocoa polyphenols, can reduce systolic pressure by 5 mmHg and diastolic pressure. Blood pressure up to 3 mmHg[23].

Rhaptopetalum coriaceum oliver: A decoction of the stem bark for the treatment of high blood pressure is always prepared or infused in locally distilled gin. Preliminary studies on plant stem bark extracts have shown hypotensive effects in NMT rats. In vitro studies of the vasodilator mechanism have shown that the effect of R. coriaceum extract at a concentration of 0.2 mg/ml is achieved by calcium channel blockade. This is achieved by inhibiting Ca2+ release induced by norepinephrine and KCl-induced Ca2+ influx and by blocking possible sensitivity and receptor tracking. Results from in vitro studies suggest that the ethanolic extract of R. coriaceum may be more effective than nifedipine as calcium channel blockers[24].

Lumnitzera racemosa: It is a beautiful tree or small tree found off the coast of India and the Andaman and N icobar islands. According to folk medicine, the fruits of this p lant can treat skin diseases and can also be used to treat snake and insect bites. The acetone aqueous extract of the plant has been reported to have antihypertensive effects. Eleven hydrolyzable tannins found in the leaves of Prunus racemosa were examined for their activities. By spontaneous tests in hypertensive rats, corilagin, casaragin and chebulinic acid were determined to be the main components[25].

Moringa oleifera: In anesthetized rats, crude extract of Olea europaea leaves at a given dose causes a decrease in systolic blood pressure, diastolic blood pressure and mean blood pressure. The blood pressure lowering effect is short-term and returns to normal within two minutes. There was no significant effect on HR except at higher doses (3 and 10 mg/kg) which caused minor bradycardia. It was determined that the thiocarbamate and isothiocyanate fractions of the crude extract also had these activities[26].

Crataegus pinnatifida: It's been used as a decoction to deal with high blood pressure for heaps of years in China. Pharmacological and laboratory tests show that it can reduce blood pressure. Two of the main heart-healthy compounds in hawthorn are flavonoids and oligomeric proanthocyanidins, which are powerful antioxidants. Rhincophylline, an alkaloid found in cat's claw, has been shown to inhibit platelet aggregation and blood clotting, suggesting that it may help prevent strokes and reduce the risk of heart disease by lowering blood pressure, improving circulation, and preventing plaque formation. Attacks and blood clots form in the blood vessel walls, brain, heart, and blood vessels[27].

Cuscuta reflexa: Extracts of C. reflexa have been reported to reduce systolic and diastolic blood pressure and HR in anesthetized rats. It was observed that the development of hyperactivity and bradycardia was dose dependent, but a decrease in HR was observed at low doses. Pretreatment with atropine (1 mg/kg) did not eliminate the cardiovascular disease of C. reflexa[28].

Apium graveolens: Celery seed extract has been shown to have blood pressure- lowering effects in deoxycorticosterone acetate (DOCA)- induced hypertensive rats. Hexane extract was more effective at lowering blood pressure, possibly by lowering catecholamine levels and lowering blood pressure. It has an antioxidant effect especially due to its flavonoid content[29].

Andrographis paniculata: Kuwang has been used in traditional Asian med icine to treat heart disease. A. paniculata extract has been shown to reduce ACE and ROS activity and reduce blood pressure in SHR rats. The crude extract of bunch is a 14-deoxy-11,12-didehydroandrographolide compound, which has the main properties of inhibiting the release and inhibiting the increase of intracellular Ca2+[30].

III. CONCLUSION-

Medicinal plants have become the focus of intense research in conservation to determine whether their traditional uses are supported by real pharmacological properties or are merely myths. Compared to synthetic drugs, herbs have no side effects and are cheaper. For centuries, herbal medicines have been used to treat many ailments, including heart diseases. It's no surprise that they've been shown to be effective in lowering blood pressure and improving heart function. Nature encourages or creates all new small areas introduced as medicine during decay. Perhaps this is why most patients use herbal medicine instead of allopathic treatment for CVD. In this review, we discuss different herbs commonly used to control and treat high blood pressure. It is also recommended that patients be well educated about long-term herbal medicine.

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