

Holistic Approaches to Hypertension: Lifestyle Changes and Natural Remedies

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ABSTRACT

The worldwide burden of hypertension and its associated cardiovascular diseases have urged researchers to explore for alternative therapies. Together with laboratory studies, field surveys on the documentation of traditional antihypertensive therapies have expanded across the world. However, a compilation and analysis of these field studies has not been done so far. This review aim to document all traditional medicinal plants used globally for the management of hypertension. Lamiaceae were the families with the most used species. The main species were *Allium sativum* L. Followed by *Aristolochia Manshuriensis*., *Avena Sativa*, *Apium Graveolens*, *Camellia Sinensis*: *Capparis Cartilaginea*: *Blond Psyllium*: *Cassiaabsus*: *Carumcopicum*: *Cassiaoccidentalis*: *Coleusforskohlii*, *Castano spermumaustrale*: *Commelina Virginica*: *Crinum Glaucum*: *Crataegus Pinnatifida*: *Zingiber Officinale*: *Triticum Aestivum*.

This study is the first of its kind to compile all traditionally used hypotensive medicinal plants across the world. It is recommended that another systematic review be conducted on the biological properties of all identified species in our review to identify those which have been scientifically validated in in vitro, in vivo, and clinical studies before they can be considered as alternative or complementary antihypertensive therapies.

The High blood pressure is also called as Hypertension. Hypertension is that state in which the pressure of the blood of the arteries increases constantly. High blood pressure usually not causes the sign and symptoms. The high blood pressure causes heart diseases like CAD (coronary artery disease), failure of heart, stroke and others include loss of memory called dementia and CKD.

Keywords: hypotensive medicinal plants, Hypertension, cardiovascular diseases.

INTRODUCTION

High blood pressure divided into two classes i.e,

- * Primary Hypertension also called Essential Hypertension.
- * Secondary Hypertension.

About 95% cases are of essential blood pressure the reason may be the genetic factor or lifestyle (the factors include in the lifestyle is the wrong diet like excess salt , obesity high body weight etc).

Now remaining of the 10% included in secondary hypertension, cause of the high blood systolic and diastolic pressure may be the narrowing of the arteries or may be the use of contraceptives or CKD Chronic kidney disease.⁽¹⁾

The measurment expressed of the high blood pressure is,

Systolic Pressure

It is the pressure in the arteries of blood when the heart

pumps. it is higher one like if the bp is 120/80 so the systolic one is 120. Range may be 100 to 130mmHg.

Diastolic Pressue

The diastolic pressure is the pressure when the heart is filling blood in the arteries. It is the lower one of the two measurements like if the bp is 120/80 so 80 is the distolic pressure. Range may be 60 to 80mmHg.

The pressure of blood is the power applied by the blood against the wall of the vessel of blood. The blood pressure relies upon the work being finished by the heart and the obstruction of the vessel of the blood.

The Global health concerns are the heart disease and hypertension. The growth of the process food industry has wide amount of salts in diet in the whole world wide suggested by WHO and thats the reason of hypertension.

The high bp is a reason of many heart diseases like Stroke, Chronic heart disease, etc

The hypertension is defined as the blood pressure abnormally high in arteries. It is a quiet executioner as in

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all respects once in a while any manifestation can be found in its beginning times until a serious therapeutic emergency happens like heart assault, stroke, or endless kidney illness . Since individuals are ignorant of extreme pulse, it is just through estimations that discovery should be possible. In spite of the fact that larger part of patients with hypertension stay asymptomatic, a few people with HTN report cerebral pains, vertigo, modified vision, or blacking out scene⁽²⁾ .

Sign And Symptoms of Hypertension:

Hypertension is most dangerous but some people don't realize in time. Indeed, almost 33% of individuals who have hypertension don't have any acquaintance with it. The best way to know whether your pulse is high is through ordinary checkups. This is particularly significant on the off chance that you have a nearby relative who has hypertension. The vast majority with hypertension won't encounter any manifestations. Individuals frequently consider hypertension the "quiet executioner" hence.

Be that as it may, when pulse comes to around 180/120 millimeters of mercury (mm Hg), it turns into a hypertensive emergency, which is a therapeutic crisis. At this stage, If your blood pressure is very high, there might be sure signs and symptoms which are as follows:

- * Shortness of breath
- * Blood in urine
- * Fluctuation
- * Headache
- * Confusion
- * Visual issue
- * Chest pain
- * Rapid heart beat

And if in children the blood pressure is high the symptoms include,

1. Severe headache
2. Muscle fatigue
3. Visibility issue
4. Bleeding nose
5. Inability to control facial muscle on face

And if in newborns and young babies have the blood pressure high the the symptoms include,

1. Seizures

2. Lethargy
3. Respiratory distress

Now people who have elevated blood pressure should consult with the physician^(3, 4).

Etiology:

Heart muscle pumped blood in the body.

Towards lungs the blood pumps with decrease level of oxygen which decreases oxygen supply.

Heart then provide oxygenated blood to the body and transfer the blood to the muscles and cells. Pressure created by this pumping action.

If the blood pressure is elevated that means that the arteries of the wall are constantly having too much force.

Causes of hypertension divided into two:

Essential Hypertension: In this type of blood pressure the causes are not established.

Secondary Hypertension:

In this type of Hypertension health probs causing elevation in blood pressure.

Now the risk factors of both essential and secondary high blood pressure are as follows:

1. **Age:**
As the blood pressure increases the vessels of the blood become less flexible and a person becomes older.
2. **Family History:**
Hypertension have a major risk of developing themselves if anyone have in your family.
3. **Background:**
Africans having more chance of developing hypertension because it is more severe in african peoples and less responsive too drugs(medications).
4. **Obesity:**
In those people who are over weight having more chance to develop hypertension.
5. **Gender/Sex:**
The high blood pressure in adult men having more chance of developing than adult women and after the age of 55years womens are more prone to hypertension.
6. **Lack Of Inactivity:**

Lack of physical activity and having a stationary way of life raise the risk of hypertension.

7. Smoking:

Tobacco consumption makes the veins thin, bringing about higher circulatory strain. Smoking likewise diminishes the oxygen content of blood's, so heart pumps quicker to redress, causing an expansion in pulse.

8. Alcohol Intake:

Drinking alcohol in extreme amount increases the risk of high blood pressure.

9. Poor Diet:

Diet high in salts and fats can easily lead to excessive high blood pressure so the dietitians suggests to avoids salt in food.

10. High Cholesterol:

Moreover 50 % people with hypertension have elevated cholesterol. An eating routine that contains loads of unhealthful fats can make cholesterol and settle down in the arteries.

11. Mental Stress:

Stress can easily make your blood pressure high so stress less and be healthy.

12. Sleep Apnea:

It is a sleep disorder causes shortness of breath while sleeping and it may causes hypertension.

13. Pregnancy:

In pregnancy womens have higher risk of hypertension because of placental disorder⁽⁵⁾.

Pathophysiology Of Hypertension:

The output of the heart and peripheral obstruction are the two determinants of blood vessel weight. Mostly the general mechanisms are understood of secondary hypertension as compare to primary hypertension. In this disease the cardiac output elevated initially with Total Peripheral Resistance i.e TRP but over the time the level of cardiac output comes to normal but the level of total resistance peripheral increased.

There are three theories who define this,

- * Kidneys are enable to excrete sodium which causes natriuretic factors, total peripheral resistance increases as the natriuretic factor secreted and promote the excretion of salt.

- * The over activating enzyme renin angiotensin causes vasoconstriction and detension of water and sodium. The elevated level of blood volume causes hypertension.

- * In the sympathetic nervous system over activated it may elevated the stress response.

The hypertension is heritable and polygenic, and sometimes genes are responsible for hypertension.

Hypertension may lead to kidney failure, and heart diseases etc. Ranfe of systolic 115/75 distolic to 185/115mmHg, increases the risk of fatal coronary disease.

Diagnosis:

To measure the hypertension i.e the raised blood presure by using a pressure measuring instrument.

The readings of hypertension given in mmHg (millimeter of mercury) having numbers which measure the pressure of your heart beat in the arteries this is the first number called systolic pressure. other number measure the pressure between the heart beats called diastolic pressure.

The four categories of blood pressure measurement^(6, 7).

1. If your blood pressure is below the range of 120/80 then it is normal
2. If your blood pressue increases in the range of 120 to 129mmHg i.e the systolic pressure and below the diastolic pressure from 80mmHg.
3. Stage 1 Hypertension: In this stage of hypertension systolic pressure range (130-139mmHg) and distolic pressure range (80-89mmHg).
4. Stage 2 Hypertension: : In this stage of hypertension systolic pressure range (140mmHg or more) and distolic pressure range (90mmHg or more).

The numbers showing on the measuring instrument of bp are important but after 50 yrs the reading is more in sysyolic. A condition in which distolic pressure is less than 80mmHg but the systolic pressure is 130mmHg or high , this condition is called ISOLATED SYSTOLIC HYPERTENSION and this is common in 65yrs older patients.

Ambulatory blood pressure test done it is 24 hrs monitoring blood pressure test and provide the accurate blood pressure picture.

Routine tests performed by doctors,

- * Urinalysis
- * Hematology
- * ECG

Epidemiology:

Hypertension is epidemic in globe, the epidemiology of HTN has studied much. In the population aged of 20 yrs or more data collected from National health and surveys of 2011-2014 estimated that hypertension in adults like 86million people effected with the popularity of 34%. Hypertension influences US people about similarly, influencing an expected men and ladies.

All inclusive, an expected 26% of the total populace has blood pressure, and the pervasiveness is relied upon to increment, driven to a great extent by increments in financially creating nations. The high predominance of hypertension demands a huge general wellbeing trouble. As an essential supporter of coronary illness and stroke, the first and third driving reasons for death around the world, separately, hypertension was the top modifiable hazard factor for incapacity balanced life.

Somewhere in the range of 2006-11, there was only 25% expansion in the quantity of individuals visiting US crisis spaces for fundamental hypertension, as indicated by an investigation of information sample in 2014. The explanation behind the expansion, in any case, stayed dubious. The rate of crisis division visits likewise expanded fundamentally, as indicated by the examination, ascending from 190.1 visits per 100,000 populace in 2006 to 238.5 visits for every 100,000 populace in 2011. Over a similar period, in any case, affirmation rates diminished, from 10.47% in 2006 to 8.85% in 2011⁽⁸⁾.

Treatment Of Hypertension:

Thiazide Diuretics:

Diuretics are those medications which remove excess water and sodium from the body through kidneys. Diuretics also called water pills. Thiazide diuretic is the first choice is drug in hypertension. Example thiazide diuretics is Chlorthalidone, Hydrochlorothiazide etc⁽⁹⁾

Angiotensin II Receptor Blockers:

They are also called ARBS. They are the medications which inhibit the action of chemicals which obstruct the vessels of blood and help to smooth the vessels of blood.

This class include medications are Losartan, Candesartan, Valsartan etc. Those patients who have chronic kidney disease also used these medications.

Angiotensin Converting Enzyme Inhibitors:

They are also called ACE inhibitors. These are the medications which block the formation of chemicals which obstruct the blood vessels and help to relax the vessels of blood. This class include medications are Benazepril, Captopril, Lisinopril etc. Those patients who have chronic kidney disease also used these medications.

Calcium Channel Blockers:

They are also called CCB. These are the medications which works in the muscles of blood vessels to relax and decreases the heart rate. This class include medications are Amlodipine, Diltiazem etc. Calcium Channel blockers medications are suitable for older patients and people of Africans as compare to ACE inhibitors.

Calcium channel blockers are contraindicated to Grapefruit⁽¹⁰⁾.

Other Medications:

Alpha Beta Blockers:

Alpha beta blockers are the medications which slow down the nerve impulses in the blood vessels and also slows down the heart beat to decrease the amount of blood which need to be pumped through the blood vessels.

They include medications are Carvedilol etc.

Alpha Blockers:

Alpha blockers are the medications which slow down the impulses of nerve in the blood vessels and also reduces the effect of natural chemicals which obstruct the vessels of blood.

They include medications are Cardura etc.

ALDOSTERONE ANTAGONISTS:

These are the medications which blocked the effect of a chemical produced naturally and excrete salts and fluid which slows down the high blood pressure.

They include Spironolactone and Eplerenone etc.

Renin Inhibitors:

Renin inhibitors decreases the production of renin enzyme produced by your kidneys and increase the pressure of blood.

They include Aliskiren

Beta Blockers:

Beta blockers are the medications which slow down the heart work load in the vessels of blood and also slows down the heart rate.

The beta blockers include medications are Acebutolol , Atenolol etc.

Beta blockers are effective when they combine with other medications.

Vasodialators:

Vasodialators fuction is directly on the muscle of the body in the arteries wall. These help the muscles from narrowing.

They Include Minioxidol And Hydralazine Etc

Central Acting Agents:

The central acting agents are the medications which protect the brain from signaling tho the nervous system and eleavate your heart rate and thin blood vessels.

Example of central acting agents include Guanfacine, Methyldopa , Clonidine etc.

Herbal Treatment For Hypertension:**Annona Muricata:**

Class name: Annonaceae

Another name: Prickly custard apple

A muricata is an individual from the group of custard apple trees called Annonaceae and a types of the variety Annona which is commom for edible fruits. In caribebean and central america the tree grows. The extract of the plant leaf decreases high bloop pressure by reducing the peripheral vascular resistance⁽¹¹⁾.

Agathosma Betulina:

Class name: Rutaceae

Another name: Buchu

Agathosma betulina is a medicinal plant of south african and it is used since centuries by indigenous people for the treatment of Alzheimer's disease and also used for the treatment of inflammation. This medicinal plant is an useful diuretic. In previous time a buchu is used for the preparation of tincture and now it is used for the treatment of many disorders⁽¹²⁾.

Aristolochia Manshuriensis:

Class name: Aristolchiaceae

Another name: Guan Mu Tong

This is the chinese plant having the characterstics of diuretics and antiphlogistic which is used for the Rheumatic pain and for treatment of edema. This plant having proprties which decrease the high blood pressure. The ingredients of this plant contain Aristolcholic acid, Tannins ,Resins, Oleanolic acid etc⁽¹³⁾.

Allium Sativum:

Class name: Liliaceae

Another name: Garlic

Garlic is used for the treatment of heart conditions and specifically for Hyperlipidemia. Garlic have hypotensive properties too. Garlic elevate the poduction of nitric oxide and smooth muscle relaxed and vasodialate. The active compound in Garlic is ALLICIN. it has benefits of healing. Garlic reduces the blood pressure in those patients who has systolic pressure high. Garlic decrease bp individually. Garlic have antioxidative and antihypertensive properties, Garlic is good for heart patients too⁽¹⁴⁾.

Artocarpus Altilis:

Class name: Moraceae

Another name: Bread fruit

In Malay Peninsula and western Pacific islands this plant is natural. An investigation has demonstrated that the extraction of leaf of the plant reduces the pressure of phenylephrine-produces the separated guinea pig aorta rings⁽¹⁵⁾

Avena Sativa:

Family name: Gramineae

Common name: Green Oat

Green Oat contain soluble rich fiber and having the properties of antihypertensive and this plant maintain the blood pressure and the lipid and glucose levels too. The green oat also used to treat cardiavascular disease and the cereals of oats also maitain systolic and diastolic pressure. The dietary therapy of soluble rich fiber helps to prevent and treat hypertension^(15, 16).

Apium Graveolens:

Family name: Apiaceae

Common name: Celery

Celery is useful for the traetment of high bp beacause it works upon the liver according to chinese theory and with liver 1 typeof hypertension is linked and this medicine is

useful for the 16 to 20 patients in china. Celery reduces the systolic and diastolic pressure. Fresh juice of celery is used for the treatment of dizziness and headache while give with the combination of vinegar. And also used to treat hypertension associated with pregnancy⁽¹⁷⁾.

Camellia Sinensis:

Family name: Theaceae

Common name: Tea

Tea has many health benefits. Researchers studied that the tea has effect on heartv diseases, same like that it is also beneficial for hypertension. Researchers also said that the fermented tea has no Effect Oh Hypertension As Compare To Unfermented Tea Reduces The Risk Of Hypertension⁽¹⁸⁾.

Capparis Cartilaginea:

Class: Capparaceae

Another name: Lasaf

In rocky ground a shrub found called lasaf. the crude extract of capparis cartilaginea decreases the high blood pressure⁽¹⁹⁾.

Blond Psyllium:

Class: Plantaginaceae

Another name: Indian plantago

Studies shows that takinG indian plantago supplememts day by day 15gm make your blood pressure low, systolic presure abt 8mmHg and diastolic abt 2mmHg⁽²⁰⁾.

Cassia Absus:

Class: Caesalpinaceae

Another name: Chaksu

The Cassia absus is found in tropical reion in india. It is showed that the extract of Cassia absus decreases the blood pressure when administered intravenously and also reduces the rate of heart at high dose. Tachyphlaxis produces while repeating injections. It is also repoerted that it has low antiacetylcholine effect⁽²¹⁾.

Carum Copticum:

Class: Umbelliferae

Another name: Ajweina

The extraction of the crude drug Carum Copticum decreses blood pressure and the heart rate.

Within a minute hypotension returns to normal. Small amount of change produce in the heart rate at low doses.

Heart action slows down at high dose⁽²²⁾.

Cassia Occidentalis:

Class: Caesalpinaceae

Another name: Cofee weed

A small tree known as Cassia, height is about 5 to 8m long. The plant leaf is used in medications. It is a anti hypertensive agent. The leaf extract having a relaxant effect on heart. Studies shows that the cassia is a smooth muscle relaxant and it decreases the blood pressure⁽²³⁾.

Coleus Forskohlii:

Class: Lamiaceae

Another name: Karpurvali

The active and main ingredients of coleus forskohlii is coleonol, and diterpene. These ingredients reduces the high blood pressure. This drug relaxes the smooth muscles. If administered in large doses colenolol on CNS gives depressing effect⁽²⁴⁾.

Castanospermum Australe:

Class: Fabaceae

Another name: Black bean

Extraction of crude drug i.e, Black beans decreases the systolic pressure as well as the diastolic pressure and this is depend upon the dose. The crude drug ingredients i.e, saponin and medicogenic acid glucoside is the main ingredients for decreasing the blood pressure in the human body⁽²⁵⁾.

Commelina Virginica:

Class: Commelinaceae

Another name: Virgina dayflower

The extraction of the crude drug reduces the phenylepinephrine enzyme and decreases the high blood pressure⁽²⁶⁾

Crinum Glaucum:

Class: Amaryllidaceae

Another name: River lily

The crude drug of this extract used for the treatment of Asthma in Western Nigeria. The drug has been used for the treatment of Cardiovascular and respiratory disorder. And it is also reported that By Increasing The dose, the tidal volume increases, and decreases the high blood pressure⁽²⁷⁾.

Crataegus Pinnatifida:

Class: Rosaceae

Another name: Chinese Hawthorn

This drug is used in China for the treatment of hypertension since many years and this drug reduces the high blood pressure. The main ingredients of this drug is flavonoids which has good effect on heart and the other one is oligomeric procyanidins which has antioxidant properties. It is also reported that this drug also used to treat heart diseases like stroke, platelet thrombosis⁽²⁷⁾.

Lavandula Stoechas:

Class: Limiaceae

Another name: Lavender

The extraction of the crude drug reduces the systolic and diastolic blood pressure and increased circulation, maintain heart rate, the consumption of oxygen of heart⁽²⁸⁾.

Lumnitzera Racemosa:

Class: Combretaceae

Another name: Black Mangrove

The fruit's of this plant is used for the treatment of skin diseases and for the treatment of insects bites like snake etc. This plant having the hypotensive agent properties so it maintain the systolic and diastolic pressure of the heart⁽²⁹⁾.

Linum Usitatissimum:

Class: Linaceae

Another name: Linseed

The main ingredients of this plant is linolenic acid, fatty acid and is used for the treatment hypertension, inflammatory bowel disorder, and the heart diseases. It decreases the Cholesterol, aggregation of platelets etc and maintains glucose tolerance level⁽³⁰⁾.

Lycopersicon Esculentum:

Class: Solanaceae

Another name: Tomato

The main ingredients of the tomato is carotenoid i.e, beta carotene, vitamin E, lycopene they all are antioxidants which is used for the treatment of high blood pressure and atherosclerosis. There is no side effect of the extract of tomato⁽³¹⁾.

Musanga Cecropiodes:

Class: Cecropiaceae

Another name: Cork wood

These plants grow in tropical area of West Africa. The plant stems containing ethanol extract having activity to treat diarrhea. The extract of leaf also used as a relaxant and having the ability to decrease the systolic and diastolic pressure, and the arterial blood pressure depend upon the dose⁽³²⁾.

Moringa Oleifera:

Class: Moringaceae

Another name: Murungai

The extraction of the plant's leaves reduces the systolic and diastolic pressure having the antihypertensive properties, within 2 mins returns bp normal. Only a high dose of the drug produces the effect on heart⁽³³⁾.

Ocimum Basilicum:

Class: Lamiaceae

Another name: Basil

The extraction of the crude drug reduces the systolic and diastolic blood pressure and increased circulation, maintain heart rate, the consumption of oxygen of heart, and returns bp normal within 2 mins⁽³⁴⁾.

Punica Granatum:

Class: Lythraceae

Another name: Pomegranate

Pomegranate decreases Angiotensin Converting Enzyme activity. It has the ability of decreasing systolic and diastolic pressure of heart⁽³⁵⁾.

Peganum Harmala:

Class: Nitrariaceae

Another name: Harmal

The extraction of the crude drug containing compounds are harmine, tetrahydroharmine, harmaline etc. Harmal is used for the treatment high blood pressure⁽³⁶⁾.

Zingiber Officinale:

Class: Zingiberaceae

Another name: Ginger

Ginger helps to maintain blood circulation and in blood vessels it relaxes the muscles. Ginger is also called blood thinner. Ginger has anti inflammatory properties. Ginger used to treat high blood pressure⁽³⁷⁾.

Triticum Aestivum

Class: Poaceae

Another name: Wheat bran

It is reported that taking wheat bran as a dietary can reduces the systolic and diastolic pressure of the heart⁽³⁸⁾.

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