Review Article

Herbs and management of hypertension: Claims, criticism, and challenges

ABSTRACT

Hypertension (HTN) is one of the most common chronic diseases affecting over 30% of the adult population globally, with a growing incidence rate. This article aims to identify the commonly used herbs for HTN treatment and examine their claims, criticisms, and challenges. It further aims to provide useful recommendations regarding the use of herbs for HTN treatment. HTN complications, such as coronary heart disease, stroke, peripheral vascular disease, vision impairment, and renal failure can result in morbidity and mortality. The high cost of conventional medications, which sometimes may not even be available or easily accessible with their unfavorable side effects as well as taking more than one pill per day, has led hypertensive patients, particularly those in rural areas, to explore alternative treatments such as herbal therapies. It is crucial to determine the different modes of action, doses, safety, and efficacy of herbal remedies used in combination with conventional medications to improve treatment adherence and enhance patient outcomes.

Keywords: Challenges, claims, criticism, herbs, hypertension

INTRODUCTION

The major health problem facing many people today is high blood pressure (HBP) known as hypertension (HTN). HTN is a widespread condition that is the leading factor of cardiovascular and cerebrovascular morbidity and mortality worldwide.[1,2] HBP has been on the rise internationally, with estimates that by 2025, the number of individuals with HBP will have risen to 1.56 billion, consisting of up to 54% of strokes, 47% of ischemic heart disease, and 13.5% of disability-adjusted life years.[3,4] The worldwide incidence of HTN and other noncommunicable diseases is rapidly rising, and the African continent appears to be the most affected. The World Health Organization (WHO) region of the Americas has the lowest prevalence (18%) of HTN, whereas the African region has the highest prevalence of HTN (27%).[4]

There is a high prevalence of HTN and noncommunicable diseases in Nigeria, which usually leads to an increase in the occurrence of cardiovascular conditions and their consequences.[1] A Country that is a member of the WHO profile report, noncommunicable diseases are responsible for an estimated 29% of all deaths in Nigeria, with cardiovascular disease (CVD) as the leading cause of noncommunicable disease-related death, accounting for 11% of deaths, or 17.9 million deaths/year.[5]

According to the WHO, HTN-related consequences accounted for 9.4 million of the yearly 17 million deaths globally due to CVD.[4] Despite the rising prevalence of HTN due to the widespread use of anti-hypertensive drugs, worldwide mean blood pressure (BP) has stayed stable or declined somewhat during the last four

Oluwakemi Elizabeth ADEOLA[1], Oluwaseyi Abiodun AKPOR[1], Oghenerobor Benjamin AKPOR[2], Modupe Motunrayo ADAMOLEKUN[1], Olusola Bolaji ADEWALE[3]

[1]Department of Nursing Science, Afe Babalola University, Ado-Ekiti, Ekiti State, Nigeria; [2]Department of Biological Sciences, Afe Babalola University, Ado-Ekiti, Ekiti State, Nigeria; [3]Department of Chemical Science, Afe Babalola University, Ado-Ekiti, Ekiti State, Nigeria

Address for correspondence: Oluwakemi Elizabeth ADEOLA, Faculty of Nursing Sciences, Afe Babalola University, PMB 5454, Ado-Ekiti, Ekiti State, Nigeria.
E-mail: adekemo11@gmail.com

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decades.[4,5] As a result, hypertensive patients, particularly those living in rural regions, seek alternate ways to their treatment of HTN and other ailments, such as herbal products.[6] Herbal remedies are increasingly being used to treat and manage CVDs, and people are becoming more interested in them.[7] As a result, the primary goal of this review is to look at the claims, criticisms, and challenges of herbs as a HTN treatment.

OVERVIEW OF HYPERTENSION

HTN, sometimes referred to as HBP, is a major risk factor for stroke (both ischemic and hemorrhagic), myocardial infarction, heart failure, chronic renal disease, peripheral vascular disease, cognitive impairment, and early death. Untreated HTN causes a gradual increase in BP, which typically leads to treatment failure due to vascular and kidney damage. One of the most common cardiovascular risk factors affects 40% of persons worldwide.[4]

HTN, often known as HBP, is the most frequent of all adult health conditions and the top risk factor for CVDs in the world. HTN, according to the WHO, is a chronic disorder marked by a steady increase it is challenging for the heart to pump blood into circulation because of a decrease in the force at which blood is pumped into blood vessels.[5] According to a new American Heart Association (AHA) recommendation, HTN is defined as having a systolic BP of 130 mmHg and a diastolic BP of 80 mmHg.[7,8]

PREVALENCE OF HYPERTENSION

The recent redefinition of HTN by the American College of Cardiology/AHA and the European Society of Hypertension (ESH), which was once classed as prehypertensive, from 140/80 to 130/80 mmHg, has significantly raised the prevalence of HTN in the United States and other Nations across the world. Prior to the AHA/ESH reclassification, the prevalence of HTN among young (>45 years of age) and older persons was approximately 30%–35% worldwide; however, when utilizing the new definition of HTN, the prevalence in adults is now >60% worldwide.[7] According to a recent study by the WHO, the prevalence rate of HTN is low (approximately 35%) in the American region but high (about 46%) in Africa and other developing nations.[8] Gender and age have been demonstrated to influence HTN knowledge and management, particularly among young adults aged 18–54 years compared to older persons aged >55 years, affecting the frequency of HTN globally.[7]

HERBAL MEDICINE

Herbal medicine is a type of alternative medicine that is used to treat a variety of ailments.[6] It is the world's oldest kind of health care, and it is used to prevent and treat physical, mental, spiritual, and psychosomatic disorders.[8] Due to their natural origins and lower side effects or unhappiness with the results of synthetic pharmaceuticals, herbal medicines, and their preparations have been widely utilized for 1000 of years in both developing and industrialized countries.[9] Herbal medicine has been defined as alternative or nonconventional modes of treatment that often involve the nonorthodox use of herbs as well as the process of consulting herbalists, mediums, priests, witch doctors, medicine men, and various local deities when seeking a solution to various illnesses.[10] Herbal treatments and spiritual healing are extremely popular in Nigeria and other regions of West Africa for the treatment of cancer, diabetes, HIV, and HTN, among other ailments.[11]

MEDICINAL HERBS USED FOR THE TREATMENT OF HYPERTENSION

Herbal medicine is essential to the practice of African Traditional medicine and it was the primary medical system available to the millions of Africans in both urban and rural settings until the arrival of Europeans.[12] Ethnobotanical studies conducted in the different regions of the world have identified hundreds of plants with anti-hypertensive properties that are used for the empirical treatment of HTN.[13-15] Cucumber (*Cucumis sativus*), Celery (*Apium graveolens*), and Garlic (*Allium sativum*) have been found to possess BP-lowering effects.[16-18] The following are the summary of research findings on some of the plants used in the treatment of HTN.

Bitter leaf plant (*Vernonia amygdalina*)

The leaves of this common shrub plant are green with a distinctive odor and a bitter taste; they are used for human consumption and should be washed before eating to remove the bitter taste. Due to their pharmacological effects, they are eaten as vegetables and have great medical value.[19] It is now widely used in the management and treatment of many disorders. Proteins, lipids, fiber, amino acids, minerals, vitamins, and carbs are all abundant in this plant, according to phytochemical research.[20,21]

Parinari curatellifolia

It is referred to as "Idofin Ako" in Yoruba and is a huge, spreading, evergreen tree that may grow up to 20 m tall. It has a single-naked stem and a dense, mushroom-shaped to roundish crown. The bark is dark grey and rough, and the new shoots are heavily covered in yellow woolly hairs. Locally, this plant is used to treat HTN in the South-western region of Nigeria. Both inotropic and chronotropic effects are present in the leaf.[22]

Guava (*Psidium guajava*)

Guava is a typical tropical plant with a lengthy heritage of traditional use. It is utilized as a folk remedy as well as cuisine. Fruit from this plant can be consumed fresh or turned into drinks, jams, and other meals. It contains a lot of minerals, iron, calcium, phosphorus, and Vitamins A and C. Organic and inorganic substances are abundant in it. According to research, the plant can be used to treat diarrhea, dysentery, gastroenteritis, HTN, diabetes, and cavities, and relieve pain while also enhancing locomotor coordination. The leaf extract can be used as a medication for mouth ulcers, cough, diarrhea, and other conditions characterized by swollen gums.[23]

Bryophyllum pinnatum

Bryophyllum pinnatum is also known as miracle leaf, never die plant, and life plant in English. Its Yoruba name is abamoda. It is a succulent herb that is green with purple serrated edges and has the ability to drop to the ground and produce new vegetative plants. It is an important ornamental and medicinal plant. It contains a variety of potent phytochemicals, including lipids, organic acids, alkaloids, triterpenes, glycosides, flavonoids, steroids, and bufadienolides. It has qualities that are anti-inflammatory, anti-microbial, anti-tumor, anti-ulcer, insecticidal, anti-diabetic, anti-convulsive, anti-oxidant, and hypotensive.[11]

Ficus exasperata (*Sandpaper leave*)

Widespread throughout Asia and Africa, the *Ficus exasperata* tree is sometimes known as the "sandpaper leaf tree." In Yoruba, the leaves are referred to as ewe epin. The leaves can also be used as sandpaper or to clean kitchen tools. Due to the presence of phytochemicals including saponins, flavonoids, tannins, sterols, coumarins, and alkaloids that have therapeutic qualities like anti-hypertensive, anti-inflammatory, and anti-toxin, among others, different portions of *Ficus exasperata* are employed in traditional medicine.[1]

Garlic (*Allium sativum*)

One of the most widely utilized herbs in the world is garlic. It is often grown as an annual plant that yields edible bulbs made up of many cloves. It has an active element called allicin, which relaxes the blood vessel cells and increases the flexibility of the arteries. In addition, it boosts the generation of nitric oxide and hydrogen sulfide, which assist to widen blood vessels and promote the free flow of blood.[24,25]

Roselle (*Hibiscus sabdariffa*)

Although it has spread to many tropical and subtropical climes, its original home is North Africa and Southeast Asia. Different plant parts are used as food and medicine by people all around the world. It is used to produce tea, known as Zobo drink in Nigeria. Moreover, medicinal tea is frequently made from it. It successfully lowers BP and relieves the signs and symptoms of HTN. It is well known to provide a variety of therapeutic benefits, including an anti-hypertensive impact.[26]

Basil (*Ocimum basilicum*)

Basil, also known as *Ocimum basilicum* and Efirin in Yoruba Country, is a fragrant, leafy green herb with a variety of names, including sweet basil, holy basil, lemon basil, curly basil, and others. It is native to Asia and Africa. The plant has essential oils, iron, manganese, calcium, Vitamin A, and Vitamin K. Eugenol and anti-oxidants in it function as a natural calcium channel blocker to stop calcium from entering the heart and arterial cells, lowering BP by enabling the blood vessels to relax.[27]

Avocado (*Persea americana*)

Avocado is a high valuable and nutritious fruit that originated from South America, its numerous health benefits make it gain recognition worldwide. Its consumption has considerably increased in the last years. The anti-hypertensive impact of *Persea americana's* aqueous seed extract has been studied.[28]

CLAIMS OF HERBS USED IN THE TREATMENT OF HYPERTENSION

According to the data from the WHO, more than 80% of people in underdeveloped nations utilize traditional medicines to maintain their health and treat a variety of clinical diseases.[11,16,29] In contrast to metropolitan settings, where cultural views and influences have less of an impact on patients' decisions concerning the source of their healthcare, traditional medicine use is more common in rural communities.[16,30,31]

Herbal remedies use is common among HTN patients, because the body is receptive to them and there are few negative effects.[32] Herbal remedies are used to treat HTN and other CVDs, either alone or in conjunction with conventional medications, for a variety of reasons, including the perception that herbs are more cost-effective and safe than conventional medicines while also being more effective and safe than conventional drugs.[16] Additionally, the majority of patients believed that herbal cures were more effective than conventional ones and that they were less authoritarian and difficult. They also believed that these treatments were more compatible with their personal religious and philosophical convictions.[33]

A previous study by Okoronkwo *et al*.[14] on patterns of complementary and alternative medicine use, perceived

benefits, and adverse effects among adult users in Enugu Urban, Southeast Nigeria. The result revealed that the majority of Nigerians are known to use and consult traditional medicine for healthcare, social, and psychological benefits due to poverty and discontent with mainstream medical care. Due to fewer side effects and negative consequences, herbal medications have been shown to be a superior option to synthetic ones. It is simple to obtain herbal remedies without a prescription.[17] Growing efforts in biomedicine to evaluate traditional medicine's efficacy have been sparked by growing knowledge of the usage of traditional medicine. Plants include a wealth of phytochemicals that have proven to be protective by lowering the risk of numerous maladies and disorders, according to research on a number of Nigerian herbal remedies. Indeed, a growing body of research supports the use of herbal medicine in connection to CVDs by providing the necessary scientific evidence.[34] Numerous ethnobotanical studies from around the world have revealed that hundred of plants can decrease BP. Consequently, they are applied to the management of HTN.[13,35]

CRITICISM OF HERBS AS A REMEDY FOR HYPERTENSION

Researchers, people, companies, and organizations have opposed the use of herbs in the treatment of HTN. Here, some of these criticisms are covered. Traditional medicine has been employed in nations where conventional medicine predominates in the National Health Care System as well as in developing nations where it continues to be used for the poor's primary health care. Traditional medicine has been practiced for many centuries and has been widely used in the last 10 years, but most nations have not formally acknowledged it, and there are few rules governing its usage or standards of quality.[36]

The increased usage of this drug combination and its negative effects, according to certain hypertensive patients who concurrently take herbal remedies and anti-hypertensive medications, has led to a global health issue that needs to be addressed.[37,38] According to Li *et al*., the majority of herbal remedies had excessive levels of heavy metals such as cadmium, lead, and mercury.[11]

Additionally, it has been demonstrated that using herbal remedies might prevent patients from adhering to bio-medical treatment plans well, and many patients only seek out bio-medical care after traditional medicine has failed to help them.[39] Herbal medicine usually contains many active ingredients, it is, therefore, important to understand how each of it works and the functional ingredients. Also, the safety and efficacy of these herbs cannot be guaranteed with limited experimental cell cultures and animal studies.[40] All herbal medicine cannot be assumed to be safe because some contain some properties that could be potentially harmful and so many of them are adulterated as some have been spiked with other botanicals or they may even not contain most of the listed botanicals on the labels.[2]

Patients do not regularly ingest these herbs but instead start taking them when they notice their BP is high, herbal medicine enables patients to self-diagnose (self-diagnosis). Their felt need (self-treatment) to lower their BP determined the frequency and length of use.[41] Because it is commonly known that people avoid telling their doctors about consumption, adverse effects to herbal products are less frequently documented. In addition, the bulk of these medications is self-prescribed for both acute and long-term conditions.[39]

Many herbs are still being used without proper evaluation, and their use is either ineffectively or completely unmonitored.[42] As a result, it is difficult to advocate the safe and sensible use of these agents because little information is available about their mechanism of action, potential negative response, limitations, and combinations with already available conventional medications and nutritional supplements.[43]

Hibiscus sabdariffa (HS) extract is thought to be natural and harmless, using it with specific medications such as acetaminophen, diclofenac, hydrochlorothiazide, or other high-risk groups can have negative side effects (gravid, lactating women and children). Several preclinical studies have revealed a comparatively low incidence of high toxicity when a maximum dose of HS extract is consumed. In addition, exposure to more over 300 mg/kg/day for more than 3 months can have substantial hepatotoxic effects.[26]

CHALLENGES OF HERBAL MEDICINE

The major challenges facing herbal medicine are as follows:

Recognition and regulation

For traditional medicine to reach its full potential, it is essential that governments respect, acknowledge, and support it. Although traditional medicine is widely used in Nigeria, there are few rules governing its usage and standards of quality.[44,45] Herbal medications are defined and categorized differently in each nation. A single medicinal plant may be classified in several nations as a food, a functional food, a dietary supplement, or herbal medication depending on the laws governing foods and medicines. In addition to seriously complicating the meaning of the term "herbal medicines" in

order to comply with national drug standards, this also causes patients and consumers to get confused.[46,47]

Efficacy and safety

The requirements intricacy cannot be disputed, and research protocols, standards, and methodologies are needed to compare the effectiveness and toxicity of herbal remedies to those of conventional or orthodox pharmaceuticals.[48-50] A combination herbal cure may include several times as many natural elements as a solitary natural treatment or medicinal plant.[51,52] The amount of time and resources needed would be enormous if each active ingredient in each herb used to design or create herbal medication had to be isolated. When an organic product incorporates, two or perhaps more plants such an analysis may realistically be impossible.[53,54]

Lack of research

Due to a lack of thorough research in this field, the pharmacologic qualities of the majority of herbs are still unknown.[55,56]

Lack of standardization

Lack of standardization of raw materials, manufacturing techniques, and finished goods, formulation of dosages, and absence of quality control standards.

Sustainability and integration

Regulation of practice and practitioners is a crucial component of policy implementation and is important for the successful integration of complementary and traditional medicine into national health care programs.[57]

Quality control of herbal medicine

The safety and effectiveness of these herbal therapies are largely dependent on the quality of the raw materials utilized in their manufacturing. In general, environmental considerations, excellent agricultural, and appropriate collection practices for medicinal plants, including plant selection and cultivation, are the extrinsic factors that affect source material quality in addition to intrinsic (genetic) characteristics. It is difficult to conduct the quality controls on the raw materials for herbal medicines because of the interaction of these elements.[58-61]

Safety monitoring of herbal medicines

Accidental use of the wrong plant species, artificial flavoring of herbal products with other substances, use of unregistered medications, contamination with harmful or dangerous ingredients, overdosing, improper use of herbal medications by patients or health-care professionals, and simultaneous use of herbal medications and other substances are just a few of the causes of adverse events resulting from the consumption of herbal medicines.[43,53]

Lack of formal training

There is no formal method of training the practitioner's attitudes of physicians toward the integration have been negative.

Recommendation and implications for nursing and health policy

The use of vehicles with loudspeakers for advertising herbal products in villages, towns, and cities is common in many developing countries such as Nigeria. Many individuals supplement their conventional medications with a variety of natural remedies, without informing their healthcare providers about the concomitant use of the herbs with orthodox medicines. Some health-care professionals also do not ask questions about their use of herbal remedies as a result of a lack of understanding about their use.[46] Therefore, there is a need for clinical nurses to be knowledgeable about the various herbs currently use as remedies for HTN and obtain information to elicit use from patients.

Health professionals need to incorporate herbal medicine into practice and be cognizant of the therapeutic treatments of their patients. The patient history information sheet needs to include information about herbal medicine use. History taking on herbal medicine must be thoroughly done and recorded. The nursing curriculum does not address herbal medicine this should be included since this medicine is closely related to nursing theories; therefore, herbal medicine could be easily included. Finally, a regulatory framework for herbal medicines requires standardization and reinforcement by the Federal Government.

CONCLUSION

It is evident that herbal medicine plays a vital role in the treatment of chronic ailments like HTN. It is culturally ingrained to hold a firm conviction in the effectiveness and safety of using herbal medicine to treat any form of HTN. The formulation of trustworthy information on the safety, efficacy, and quality of herbal medicinal products will benefit from a more thorough understanding of the mechanisms of action of herbal medicines and improved methods of extract standardization.

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