



A Review of Medicinal Herbs in the Lamiaceae Family Used to Treat Arterial Hypertension

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ABSTRACT

Today, high blood pressure (arterial hypertension) is one of the most common cardiovascular diseases all over the world, particularly in developing countries. The Lamiaceae family is considered as one of the most important herbal families that have many plants with various pharmacological and therapeutic use around the world. This study aims to review medicinal herbs in the Lamiaceae family used to treat hypertension around the world. The obtained results of the present review investigation demonstrated that 26 medicinal herbs were traditionally used to treat hypertension around the world. The most important parts of these plants are leaves, roots, and flowers, respectively; whereas these medicinal herbs are most commonly used in Asian and African countries such as Iran, Pakistan, India, South Africa, etc. The results demonstrated that medicinal herbs in Lamiaceae family have universally used to treat hypertension. Thus, we can consider them as alternative agents for treatment of hypertension; nevertheless, more investigations are mandatory to elucidate the precise anti-hypertensive mechanisms and also toxicity of these plants in human subjects.

Keywords: hypertension, anti-hypertensive, herbal medicines, Lamiaceae, traditional medicine.

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INTRODUCTION

One of the most common cardiovascular diseases among the world population particularly in developing countries is high blood pressure which is also called “arterial hypertension” (AHT) [1]. This condition occurs when there is a change in cardiac output, regional vascular resistance, or both [1]. Hypertension has been defined as bringing up the blood vessel pulse, ordered into three phases as indicated by the patient's level of systolic and diastolic circulatory strain [2]. According to the definitions of World Health Organization, AHT was described as a health condition that results in a constant increase in blood pressure (BP) of the arteries of individuals [3].

Today, it has been proven that AHT increases the risk of a number of cardiovascular diseases

such as coronary heart disease, congestive heart failure, ischemic and hemorrhagic brain strokes, angina, myocardial infarction, development of thrombosis, etc. in individuals [4, 5]. Now, there are two important approach for treatment of AHT, (a) use of the chemical and synthetic agents including diuretics, beta blockers, calcium channel blockers, etc.; (b) modifying lifestyle through consistent exercise, decreasing salt consumption, keeping the ideal weight, etc. [6-8]. In recent years, studies have shown that the use of chemical medications due to a number of adverse side effects have some limitations; thus, people tend to use alternative therapies especially natural products including herbal medicines with high efficacy and lower complications [9-12].

The use of herbal medicine represents a long history of human body [13]. And, medicinal plants have also been widely used as medicinal

and aromatic plants since the ancient times [14]. Many studies around the world have been conducted on the use of medicinal plants in the treatment of AHT which demonstrated high potential and minimum side effects of medicinal herbs compared to the existing chemical drugs [15-19].

Among the plants, Lamiaceae is considered as one of the most important families that have many plants with various pharmacological and therapeutic use around the world [20]. As [21] pointed out the Lamiaceae family is one of the most popular and representative plant groups, and nowadays, it is used both in traditional and modern medicine, as well as in the pharmaceutical and food industries. This study aims to review medicinal herbs in the Lamiaceae family used to treat hypertension worldwide.

MATERIALS AND METHODS

In the present review investigation, we used different databases including Web of Science,

PubMed, Google scholar EMBASE, Scopus and directory of open access journals (DOAJ). To achieve better results, our search was performed based on the combinations of some key words and their equivalents; hypertension, arterial hypertension, high blood pressure, herbal medicines, ethnobotany, medicinal plants, traditional medicine, Lamiaceae, etc.

RESULTS

The obtained results of the present review investigation demonstrated that 26 medicinal herbs were traditionally used to treat hypertension around the world. The most important parts of these plants are leaves, roots, and flowers, respectively; whereas these medicinal herbs are most commonly used in Asian and African countries such as Iran, Pakistan, India, South Africa, etc. Table 1 shows the medicinal plants that traditionally used to treat hypertension around the world.

Table 1. The medicinal herbs in Lamiaceae family used to treat hypertension around the world.

No.	Plant	Growth form	Part(s) of used	Distinct
1	<i>Ajuga bracteosa</i> Wall. ex Benth	Herb	Leaves	[22]
2	<i>Ballota Africana</i> (L.) Benth	Herb	Leaves	[23-26]
3	<i>Coleus forskohlii</i>	Herb	Root	[27]
4	<i>Isodon rugosus</i> (Wall. ex Benth.) Codd	Shrub	Leaves, roots	[28, 29]
5	<i>Lamium album</i> L.	Herb	Leaves	[28]
6	<i>Lavandula stoechas</i> L.	Herb	Leaves	[30]
7	<i>Leonotis leonurus</i> (L.) R.Br	Shrub	leaves, roots and flowers	[23-26]
8	<i>Mentha aquatic</i>	Herb	Leaves, stems, seeds	[31-33]
9	<i>Mentha longifolia</i> L.	Shrub	Stem and leaves	[23-26]
10	<i>Mentha longifolia</i> L.	Herb	Leaves, stem	[34]
11	<i>Mentha viridis</i> L.	Herb	Leaves	[35]
12	<i>Ocimum basilicum</i> L.	Herb	Leaves, roots	[22]
13	<i>Origanum vulgare</i> L.	Herb	Leaves	[36]
14	<i>Otostegia limbata</i> Benth. ex Hook.	Shrub	Leaves	[22]
15	<i>Polygonum orientale</i>	Herb	Leaves, roots, flowers	[37]
16	<i>Polygonum punctatum</i>	Herb	Leaves, roots	[38]
17	<i>Salvia africanacaerulea</i> L.	Herb	Leaves	[23-26]
18	<i>Salvia bucharica</i> Popov	Herb	Flower, leaves	[39]
19	<i>Tetradenia riparia</i>	Shrub	Leaves, seeds	[40]
20	<i>Teucrium stocksianum</i> Boiss.	Herb	Leaves, twigs, roots	[41]

Table 1. Continued

No.	Plant	Growth form	Part(s) of used	Distinct
1	<i>Ajuga chamaecistus</i>	Herb	Aerial part	[42]
2	<i>Lavandula stoechas</i>	Herb	Leaves, roots	[35]
3	<i>Marrubium anisodon</i> Koch	Herb	Leaves, roots	[43]
4	<i>Ocimum gratissimum</i>	Herb	Leaves	[44]
5	<i>Rosmarinus officinalis</i> L.	Herb	leaves, roots and flowers	[45]
6	<i>Salvia</i> spp.	Shrub, herb	Leaves, petal	[42]

DISCUSSION

Today, among cardiovascular diseases, hypertension is considered as a major health problem around the world; with a prevalence of 35-40% among the world's population [46]. The disease is described an increase in systolic blood pressure ≥ 140 mm/hg and diastolic blood pressure ≥ 90 mm/Hg, distinctly or together [47, 48].

Based on the existing documents, humans applied medicinal herbs from thousands of years ago until now to treat their diseases around the world. Recently, the use of numerous drugs for the treatment of hypertension, and also the occurrence of some dangerous side effects of these medications result in a change in people's attitudes toward more use of medicinal plants [49]. For these reasons, the present investigation was designed to review medicinal herbs in the Lamiaceae family used to treat hypertension around the world. The obtained results of the present review investigation demonstrated that 26 medicinal herbs in Lamiaceae family were traditionally used to treat hypertension around the world. The most important parts of these plants are leaves, roots, and flowers, respectively; whereas these medicinal herbs are most commonly used in Asian and African countries such as Iran, Pakistan, India, South Africa, etc.

Based on the previous phytochemical investigations on plants from this family, the main compounds were tannin, polyphenol, flavonoids, alkaloids, as well as terpenoides. Previous studies have demonstrated that polyphenols have been measured as a therapeutic agent against various diseases such as cardiovascular diseases; whereas it can play a preventive role for hypertension [45-49]. Considering the flavonoides which are the main constituents in the plants of Lamiaceae family, previous study has proven

that these compounds are directly associated with lower coronary heart disease mortality [50].

Regarding the sesquiterpene as terpenes derivatives which were observed in Lamiaceae family, it has been previously proven that these components are associated with numerous biological and pharmacological characteristics including antitumor, antibacterial, cardiotoxic and anti-inflammatory effects and relax smooth muscles [51-54].

Another important ingredient in the plants of this family is tannin; in the study conducted by Zargham et al (2008), high efficacy of tannin has been proven to prevent or treat atherosclerosis and its clinical symptoms [55].

In the case of alkaloid components, previous investigations demonstrated that these components had high potential for treatment of cardiovascular and central nervous systems diseases including hypertension, bradycardia, arrhythmia, sedation, vascular dementia, and amnesia [56]. Therefore, it can be proposed that anti-hypertensive effects of these plants in Lamiaceae family are probably associated with the presence of these components.

CONCLUSION

The results demonstrated that medicinal herbs in Lamiaceae family have universally been used to treat and reduce hypertension. Thus, we can consider them as alternative agents for treatment of hypertension; nevertheless, more investigations are mandatory to elucidate the precise anti-hypertensive mechanisms and also toxicity of these plants in human subjects.

Conflicts of interest

The authors declare no conflict of interest in this study.

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