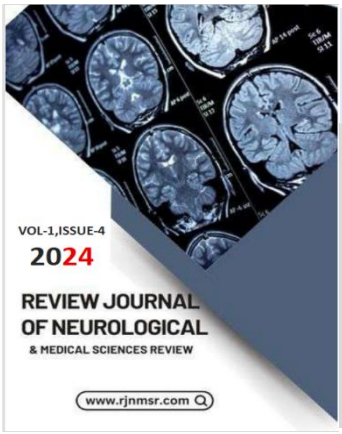

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A Comprehensive Review on Hypertension

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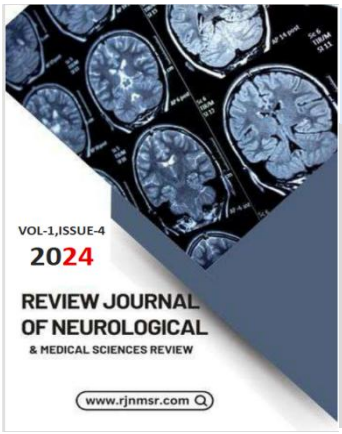
Abstract

The medical term for elevated blood pressure is hypertension (HTN). It's harmful since it strains the heart and adds to atherosclerosis (artery hardening), as well as raising the hazard of cardiac disease and stroke. Other complications of HTN include congestive heart failure, renal dysfunction, and eyesight. Traditional antihypertensives are frequently accompanied with a slew of negative side effects. Herbal remedies are utilized by 75 to 80 percent of the world's population for basic health care, particularly in developing countries, due to their better compatibility with the human body and less side effects. Many concentrated efforts have been directed toward investigating local plants with hypotensive and antihypertensive medicinal qualities during the last three decades. Some of these medicinal plants' hypotensive and antihypertensive benefits have been proven, while others have been proven false. However, Ayurveda knowledge must be combined with contemporary medicine, and more scientific study is needed to confirm the efficacy and define the safety profile of herbal medicines with antihypertensive potential

Introduction

High blood pressure (BP) or hypertension (HTN) is a chronic medical disorder in which the pressures of blood are abnormally high in the arteries. It is either primary or secondary in nature. Primary HTN refers to high blood pressure that has no medical explanation. It affects 90 to 95 percent of people (Carretero & Oparil, 2000). In the remaining 5 to 10% of patients, secondary HTN is caused by numerous illnesses affecting the kidneys, arteries, heart, or endocrine (Beevers et al., 2001).

HTN is a leading cause of chronic kidney disease and a risk factor for strokes, heart attacks, heart failure, and arterial aneurysms (Pierdomenico et al., 2009). A moderate increase in arterial blood pressure reduces life expectancy.



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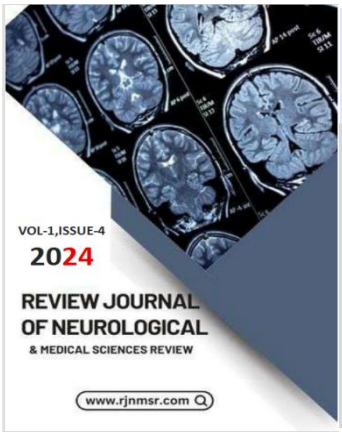
Dietary and lifestyle modifications, as well as medications, can help regulate blood pressure and reduce the risk of health issues.

HTN is divided into three stages: HTN stage I, HTN stage II, and isolated systolic HTN. Isolated systolic HTN is a condition in which the systolic pressure is raised but the diastolic pressure is normal. It is frequent among the elderly. These categories are determined by averaging a patient's resting blood pressure measurements across two or more visits to the doctor's office. If a person's blood pressure is continuously at least 140 mmHg systolic or 90 mmHg diastolic, they are diagnosed with HTN. Patients with blood pressures more than 130/80 mmHg who also have diabetes or renal disease should be treated further. If treatments do not bring blood pressure back to normal, HTN is considered resistant (Chobanian et al., 2003). Exercise HTN is characterised by an abnormally high increase in blood pressure during exercise (Jette et al., 1987). For systolic levels during exertion, a range of 200 to 230 mmHg is considered typical (Pickering, 1987). Exercise-induced hypertension can suggest a person's likelihood of developing HTN during rest (Rost & Heck, 1987).

Causes

Essential hypertension is a condition in which the blood pressure is the most common kind of HTN is essential HTN, which affects 90 to 95 percent of hypertension individuals (Carretero & Oparil, 2000). Although no single cause has been identified, sedentary lifestyles, stress, visceral obesity, potassium deficiency hypokalemia (Kyrou et al., 2006), obesity (Wofford & Hall, 2004), more than 85 percent of cases occur in those with a BMI greater than 25 (Haslam & James, 2005). Salt (sodium) sensitivity (Lackland & Egan, 2007) alcohol (Djoussé & Mukamal, 2009) intake and vitamin D deficiency all contribute to the development of HTN (Lee et al., 2008) Aging, certain inherited genetic mutations (Dickson & Sigmund, 2006) and having a family history of HTN all raise the risk of developing HTN (Luma & Spiotta, 2006). Another risk factor is an increase in renin, a kidney-secreted enzyme, as well as sympathetic nervous system over activity (Sorof & Daniels, 2002). Insulin resistance, which is part of syndrome X, or the metabolic syndrome, is considered to have a role in the development of HTN. Consumption of high fructose corn syrup-containing foods may raise the chance of getting HTN (Hwang et al., 1987). Hypertension that develops as a result of something else Secondary HTN, by definition, is the outcome of a known cause. This form of HTN is distinct from essential HTN in that it is treated by addressing the underlying cause of the increased blood pressure. HTN causes a compromise or imbalance in the pathophysiological systems that govern blood plasma volume and cardiac function, such as the hormone-regulating endocrine system. HTN is caused by a variety of factors. Some secondary causes are well-known and well-known, such as Cushing's syndrome, a disorder in which the adrenal glands overproduce the hormone cortisol (Dodt et al., 2009). Other illnesses that produce hormone abnormalities, such as hyperthyroidism,



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hypothyroidism, and adrenal gland cancer, can also cause HTN. Kidney illness, obesity/metabolic problem, pre-eclampsia during pregnancy, the congenital abnormality called as coarctation of the aorta, and some prescription and illicit medicines are also major causes of secondary HTN.

Medicinal Plants used for the Treatment of Hypertension

Agathosma Betulina

It is a species of Agathosma and belongs to family Rutaceae. This is commonly known as Buchu. It's a South African medicinal plant that's been used for generations by the region's indigenous peoples to treat a variety of maladies. It works as a diuretic and an anti-inflammatory. Buchu was utilised by early Dutch immigrants to manufacture a brandy tincture, which is still used to cure a variety of ailments today (Simpson, 1998).

Allium Sativum

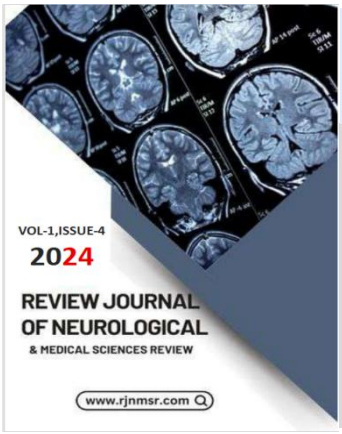
Allium sativum is a kind of onion and belongs to Alliaceae Family. This is commonly known as Garlic. Garlic has traditionally been used to treat a range of heart problems, including hyperlipidemia. It's also been said to have hypotensive properties. It is considered to cause smooth muscle relaxation and vasodilation by increasing nitric oxide generation. Allicin is one of the key active chemicals in garlic that gives it its distinctive odour and many of its health benefits. According to a meta-analysis of randomly selected literature data, garlic is connected to decreased blood pressure in persons with high systolic pressure, but not in people with normal systolic pressure (Reinhart et al., 2008). Garlic formulations were shown to be more effective than placebo in lowering blood pressure in people with HTN (Ried et al., 2008). Garlic has been shown to have antioxidative and antihypertensive properties in 20 individuals with HTN compared to 20 participants with normal blood pressure who received garlic pearls preparation for two months. The findings demonstrated lower blood pressure, a considerable drop in 8-hydroxy2-deoxyguanosin, nitric oxide, and lipid peroxidation, as well as an increase in antioxidative vitamins C and E. Garlic appears to have a cardio protective effect in essential HTN, according to this study (Dhawan & Jain, 2005)

Annona Muricata

It is a species of Annona muricata and belongs to Annonaceae family. This is commonly known as Prickly Custard apple. A muricata is a member of the Annonaceae family of custard apple trees and a species of Annona, which is well known for its tasty Annona fruits. The tree may be found throughout the Caribbean and Central America as a natural species. The plant's leaf extract has been shown to reduce blood pressure through lowering peripheral vascular resistance (Hasrat et al., 2004).

Apium Graveolens

Apium graveolens is a kind of apium and it is from Apiaceae family. This is commonly known as Celery. Celery is useful for HTN, according to Chinese thought, since it affects the liver; one form of HTN is linked to the liver. Celery was found to be effective in lowering HTN in 14 of 16 patients in mainland



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China. For up to one week, 8 ounces of juice were combined with an equal quantity of honey and consumed orally three times a day (Somanadhan et al., 1999). It has also been shown to lower systolic and diastolic blood pressure. The difference in blood pressure in humans before and after treatment was significant (P0.05), showing that A. grave lens seeds can be utilized as a safe and effective therapy for high blood pressure. Dizziness, headaches, and shoulder discomfort associated with HTN can be relieved by mixing fresh celery juice with vinegar. It's also used to treat HTN that's linked to pregnancy and climacteric (Simpson, 1998).

Daucus Carota

Daucus carota is a kind of carrot and it is belongs to Umbelliferae family. This is commonly known as Carrot. It has been used to treat HTN in traditional medicine. The separation of two coumarin glycosides designated as DC-2 and DC-3 was achieved by activity-directed fractionation of aerial portions of D. carota. In NMT anaesthetized rats, intravenous injection of these compounds resulted in a dose-dependent (1–10 mg/kg) decrease in arterial blood pressure. Both compounds had a dose-dependent (10– 200 g/ml) inhibitory impact on spontaneously beating guinea pig atria as well as K+-induced rabbit aorta contractions at comparable doses in in vitro tests. These findings suggest that DC-2 and DC-3 may decrease blood pressure by blocking calcium channels, and that this action may be responsible for the BP-lowering impact seen in in vivo investigations(Gilani et al., 2000). Daucuside and daucusol, two novel guaiane-type sesquiterpene terpenoids with an intriguing epoxy unit, have been discovered from D. carota fruits (Fu et al., 2010).

Fuchsia Magellanica: Fuchsia magellanica (Magellanic Fuchsia) (Family: Onagraceae; Common name: Hardy Fuchsia, Chiko, Tilco). This plant is endemic to Argentina and Chile's southern regions. The leaf extract decreases body temperature, serves as a diuretic, and lowers blood pressure when infused (Houghton & Manby, 1985). In NMT rats, Schmeda-Hirschmann et al. (1992) studied the ethanol/aqueous extracts of this species and discovered a moderate to substantial drop in mean arterial pressure.

Musanga Cecropiodes

Cecropiodes Musanga belongs to Cecropiaceae Family and commonly known as Umbrella tree, Cork Wood. It is a fast-growing plant that may be found throughout the tropical rain forests of the world, notably in West Africa. Antidiarrheal action has been discovered in an ethanol extract of the plant stem bark (Owolabi et al., 2010). Several researchers have established the latex and leaf extract's scientific usefulness as a vasorelaxant, and hence a hypotensive agent (Kamanyi et al., 1991). The aqueous extract of the stem bark was shown to reduce mean arterial blood pressure in a dose-dependent manner, falling by 4.51 0.5 mmHg at 10 mg/kg and 65.23 6.28 mmHg at 40 mg/kg (Adeneye et al., 2006).

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Peganum Harmala

Peganum harmala is a species of peganum. This is belongs to Nitrariaceae family and this is commonly known as Harmal. In anaesthetized rats, the crude extract fraction and all pure compounds from P. harmala: harmine, harmaline, tetrahydroharmine, harmol, and harmaloi displayed antihypertensive effects in a dose-dependent manner (Gilani et al., 1992).

Raphanus Sativus

Raphanus sativus is belongs to Cruciferae family and commonly known as Radish. This is a plant that belongs to the herb was discovered to have antihypertensive properties. Isolated tissue preparations were suspended in Krebs solution-containing tissue baths for a 24-hour acute toxicity investigation in mice. The extract reduced BP and HR in rats in a dose-dependent (0.1-3 mg/ kg) manner, which was mediated by an atropine-sensitive route. It inhibited force and rate of contractions in isolated guinea-pig atria in a dose-dependent (0.03-3.0 mg/ml) manner. The inhibitory impact of atropine was reduced in atropine-treated tissues, revealing a heart stimulant activity that was robust to adrenergic and serotonergic receptor blockage. It suppressed phenylephrine-induced contractions in endothelium-intact rat aortas, which were prevented by atropine. The extract was found to be safe in mice at doses of up to 10 g/kg. The study found that the plant's cardiovascular inhibitory effects are mediated through muscarinic receptor activation, which might support its usage in HTN (Ghayur & Gilani, 2006).

Vitex Doniana

Doniana Vitex belongs to Verbenaceae family and it is commonly known as Black plum. Ladeji et al. studied the effects of an oral extract of this plant on rats' blood pressure. The extract was discovered to have hypotensive properties. Within 45 minutes of taking the extract orally, both systolic and diastolic blood pressures were considerably lower. After 2 hours, the blood pressure began to return to normal (Ladeji et al., 2005).

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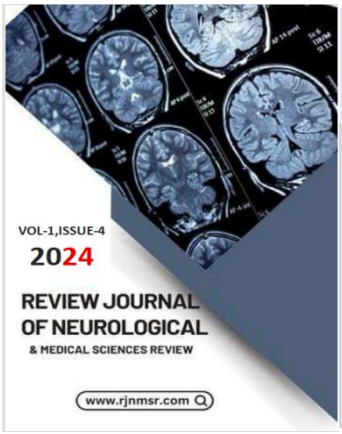

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