

AN OVERVIEW ON ROLE OF AMALA POWDER AS A DIETARY SUPPLEMENTS FOR THE MANAGEMENT OF HYPERTENSION**^{1,*}Manisha Sahu, ¹Vijay Laxmi Gautam and ³Ajai Kumar Pandey**¹Department of Rachana Sharir, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India²Department of Kayachikitsa, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi, India**Received 25th October 2023; Accepted 18th November 2023; Published online 29th December 2023**

Abstract

Background- Hypertension is a global problem, which is associated with cardiovascular renal problems. The available modern medicament solves the hypertension and its related consequences up to some extent. The researchers are inclined towards other systems of healthcare for its prevention & management. Now a days, there is gaining interest in using nutritional supplements as an alternative to conventional medicine for its care and cure. Amala (*Emblica officinalis*) is widely used fruit with rich history of traditional medicine and it has many health benefits. It is commonly known as Indian gooseberry, can prevent high blood pressure, heart disease, stress, anxiety, and other health problems. Amala rejuvenates the body by giving nutritional support, and keep us away from all diseases. **Objectives** – This review aims to assess the potential role of Amala powder as a dietary supplement to control blood pressure. **Methods-** Systemic review will be carried out regarding Amala and its impact on Blood Pressure. It will be focused on various bioactive compounds such as vitamin c, polyphenols, and flavonoids present in amala powder. We explored their potential of action, including anti-oxidant, anti-inflammatory and vasodilator properties that may help control blood pressure. **Results-**Research results show that Amala powder supplementation can lead to a reduction in blood pressure and it may be effective in controlling blood pressure. We have trying to emphasize the importance of Amala and its products in general and specific to hypertension. Overall, there is a need for further clinical studies to determine dosage forms and its long- term effectiveness. **Conclusion-** We finally conclude that Amala powder may be effective as a dietary supplement not only controlling blood pressure but also aid some other health benefits, due to its rich composition of bioactive compounds. At present, Amala powder is still in the search for the planning of new nutritional strategies to prevent heart stroke by offering a simple and easy way to control blood pressure. Although preliminary studies are promising, more research is needed to confirm its long-term safety and effectiveness.

Keywords: Amala, High blood pressure, Heart disease, Vitamin C.

INTRODUCTION

Amala (*Emblica officinalis* L.) a plant of the Euphorbiaceae family is widely distributed in subtropical and tropical areas of India, Indonesia, China, and Malaysia¹. Amala is a good source of Polyphenol, flavones, tannins and other bioactive compounds². *Phyllanthus emblica* locally termed as amala or Indian gooseberry is an extraordinarily commonly used herb in Indian Ayurvedic systems. It is known by the common name “the King of Rasyana” due to its spectacular renewal, revitalization, and reconstructive capacities. Recently it has been seen that the extract of amala has diverse pharmacological effects³. The fruits of amala are widely used in Ayurveda and are believed to increase defense against diseases. A recent study for the research work showed that the active compounds contained by *Phyllanthus emblica* have significant medicinal value. It has a beneficial role in the treatment of cancer, diabetes, liver treatment, heart trouble, ulcers, anemia, and various other diseases. Similarly, it has applications as antioxidant, immunomodulatory, antipyretic, analgesic, cytoprotective, diuretic, laxative, carminative stomachic, antitussive, and gastroprotective. Amala is supposed to rejuvenate all the organ systems of the body and provide strength and wellness. It keeps us away from all diseases by boosting our immune system⁴.

Amala is highly nutritious and one of the richest sources of Vitamin C, which is important for human beings. It is necessary for the synthesis of the inter-cellular cementing substance which is responsible for keeping the cells of the body together and helps in reducing the chances of high blood pressure which in turn also alleviates the chances of other cardiovascular diseases⁵. Today, the uncontrolled way of life is the root cause of all sorts of miseries and many ill-fated diseases in mankind. Hypertension is a major public health problem due to its high prevalence all around the globe and important risk factors for chronic heart disease, stroke, and other cardiovascular disease. Elevated BP is positively correlated to the risk of stroke and coronary heart disease. Other than CVD, its complications include heart failure, peripheral vascular disease, renal impairment, retinal hemorrhage, and visual impairment. Hypertension is a central cause of untimely death worldwide⁶. Hypertension is typically classified based on systolic BP (SBP) and diastolic BP (DBP). SBP is the BP in vessels during a heartbeat. DBP is the pressure between heartbeats. According to the New American College of Cardiology and American Heart Association, normal BP ranges below SBP 120 mm Hg/DBP 80 mm Hg, and elevated BP ranges from SBP 120-129 mm Hg/DBP <80 mm Hg, and that of high hypertension is defined as SBP ≥140 mm Hg and DBP ≥90 mm Hg⁷. Hypertension increases the risk of stroke, heart failure, and myocardial infarction. The worldwide prevalence of hypertension is estimated at 1.28 billion adults aged between 30 and 79 years⁸. Further, the prevalence of hypertension is 26.4% of the world population and is predicted to increase by 60% of adults will have

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hypertension by the year 2025⁹. According to the WHO, the global target is to decrease the prevalence of hypertension by 33% between 2010 and 2030¹⁰. It has been found that hypertension is the most universal risk factor in acute myocardial infarction and is responsible for about 16.5% of deaths annually worldwide. In addition, high blood pressure is accountable for 8.5 million deaths from ischemic heart disease, stroke, other vascular diseases, and renal disease worldwide¹¹.

Potential Action of Amala

The bioactive compounds in Amala may influence blood pressure through several mechanism, which is-

- **Anti-oxidant Effects** Amla is rich in antioxidants such as gallic acid, ascorbic acid, and phenolic compounds and thus helps the body's immune systems and digestion¹².
- **anti-inflammatory, analgesic, and antipyretic** effects the leaves and fruit extracts of *Emblica officinalis* possess analgesic and antipyretic, as well as anti-inflammatory action. Aqueous and ethanolic extracts of amla have been claimed to have analgesic properties because of peripheral¹³.
- **Cardio-protective** Several investigations have reported amla as a substantial protective measure against modifications in the myocardial system because of the strong antioxidant along with the free radical scavenging activity of amla. It improves cardiovascular health by decreasing triglycerides and increasing cholesterol profile¹⁴.
- **Anticancer** Phenolic contents and pyrogallol found in amla are responsible for the antiproliferative action of amla whereas, polyphenols and hydrolyzable tannin-derived compounds have been stated to prevent mutagenesis and lipid peroxidation induced by carcinogens¹⁵.
- **Gastric ulcer** It was then reported that Amla extract exhibits antisecretory, cytoprotective, and antiulcer properties¹⁶.

Nutritional Value of fruit of *Phyllanthus emblica* (% or per 100g)¹⁷.

Chemical components	percentage
Fruits: Moisture	81.2%
Protein	0.5
Fat	0.1
Mineral matter	0.7
Fiber	3.4
Carbohydrate	14.1
Bulk elements Mg/100g	Net weight
Calcium	0.05
phosphorous	0.02
Iron	1.2 mg/100g
vitamin C	600mg/100g
Nicotinic acid	0.2mg/100g

(Gopalan *et al.*, 1991)

MATERIALS AND METHODS

To collect the studies on the hypertension effects of amala powder, PubMed, Science Direct, Scopus, Google, Google Scholar, and Cochrane databases were searched using the terms amala, *Emblica myrobalan*, *Emblica officinalis*, *Emblica pectinata*, Indian gooseberry, and *Phyllanthus emblica* together with antioxidant, cardioprotective, cardiotoxicity, heart disease, heart failure, hyperlipidemia, hypertension, myocardial dysfunction, and oxidative stress.

Literature related to a systematic review of Hashem-Dabaghian *et al.* in 2018, the cardiovascular effects of this plant have been investigated. According to the results of this review, EO has antiatherogenic, antihypertensive, anti-inflammatory, antioxidant, antiplatelet, vasodilator, and lipid deposition inhibitory effects. Moreover, it improves vascular endothelial function¹⁸. Another study was conducted on over 150 patients with essential hypertension. These patients were given an aqueous extract of 500mg of *Phyllanthus emblica* and a placebo in capsule form for a period of 12 weeks. Both the *Phyllanthus emblica* and placebo results were compared at the baseline and after the completion of 12 weeks. It showed that *Phyllanthus emblica* was significantly effective in reducing the blood pressure of patients with hypertension¹⁹. Another study performed the effect of Indian gooseberries on blood pressure and lipid profile of the patients. In the study, a total of 60 patients were taken out of which 40 were given 500mg of *Phyllanthus emblica* powder, and the rest of 20 patients were given 20mg of simvastatin as a placebo both in capsule form for 42 days. After 42 days, the samples of the patients were analysed to determine the lipid profile as well as monitoring of blood pressure. The result of both the samples showed a significant effect in the reduction of high blood pressure and controlled lipid profile of the patients but the most effective results were given by Indian gooseberry. It provides significant protection against diseases like coronary artery disease and atherosclerosis without having any negative effects on blood pressure and lipid profile of patients²⁰. A study was conducted worldwide to measure the prevalence of hypertension and the methods of its diagnosis, treatment and controlling of its risk factors from the year 1990 to 2019. This study was conducted in over 200 countries. The data were collected from 1990 to 2019 of patients aged from 30 to 79 years. The data contained all the hypertensive patients and the treatment they have received. Around 49% of men and 59% of women reported a previous diagnosis of hypertension globally. And 47% of women and 38% of men were treated. Around 23% of women and 18% of men have successfully controlled their hypertension as per reports globally. According to the study, since 1990, treatment and control rates have been improved especially in high-income countries as compared to low-income countries which have fewer improvements in controlling hypertension among patients²¹.

The *Phyllanthus emblica* fruit is considered to be highly efficient in lowering the risks of cardiovascular diseases out of which the most common are high blood pressure and high cholesterol levels in the body. One of the studies indicates the efficiency of amla fruit in the prevention of hypertension, hyperlipidemia, arrhythmia, cardiotoxicity, and heart failure. This study was performed on nineteen *in vitro* and animal samples. Its clinical trials were accessed by the Jadad scale and animal studies were accessed by the ARRIVE checklist. The study showed that *Phyllanthus emblica* impacts various risk factors of cardiovascular diseases and can be effective in protecting against serious heart problems²². Patients with uncontrolled hypertension were randomized and divided into two equal groups. The first group was assigned to take 500mg of *Phyllanthus emblica* in capsule form and the other group was assigned to take a placebo consisting of standard antihypertensive drugs. Both the capsules were assigned to be taken two times a day after meal for a period of about eight weeks. Systolic blood pressure, diastolic blood pressure and heart rate were measured after 2,4,6 and 8 weeks of the study. The study indicated that systolic blood pressure was decreased

by 8-15% in patients who were given *Phyllanthus emblica* capsules and 6-7% in those who were given placebo capsules. The study also indicated that diastolic blood pressure was decreased by 7-12% in the *emblica* collection and 3-7% in the control group. This indicated that patients given *Phyllanthus emblica* reduced their blood pressure more efficiently than those patients who took standard hypertensive drugs²³.

Conclusion

Amala powder, with its rich content of bioactive compounds, holds promise as a dietary supplement for the management of hypertension. The antioxidants, vasodilatory, and anti-inflammatory properties of amala suggest the potential benefits of reducing blood pressure and improving cardiovascular health. While preliminary studies show promise, further research is needed to confirm its efficacy and safety in diverse populations. Incorporating amala into a balanced diet, under the guidance of healthcare professionals, may offer a natural and complementary approach to hypertension management.

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