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# Herbal Drug Used in Hypertension

*Ginger (Zingiber officinale Roscoe)*

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## ABSTRACT

Ginger is an ancient herbal used for the treatment of variety of diseases. It has a diuretic and blood pressure-lowering effect so it is recommended by Food and Drug Administration (FDA) as a food additive that is generally recognized as safe. Zingiber officinale (ZO) has a long history of traditional use. It contains several constituents such as gingerol, ginger diol, ginger Dione, betacarotene, capsaicin, caffeic acid and curcumin. The present study was undertaken to investigate the effect of consumption of ZO on heart rate and blood pressure (BP). Hypertension is a major factor in coronary artery disease and lead to death.

**Key Words:** ***Zingiber officinale Roscoe, Hypertension***

## INTRODUCTION

Zingiber officinale (ZO), commonly known as “ginger”, is indigenous to southern China, from whence it spread to the Spice Islands and other parts of Asia, and subsequently to West Africa and the Caribbean.

Hypertension (HTN) is the major health problem that leads to cardiovascular disease. It means blood pressure equal or increase than 140/90 mm Hg. Hypertension can be categorized into high normal when systole of blood pressure (SBP) 130–139 mm Hg and/or diastole 80–89 mm Hg. Grade (1)140–159 mmHg systolic; 90–99 mmHg diastolic). Grade (2) hypertension is a systole of blood

pressure 160-179 mm Hg or higher or a diastole of 100-109 mm Hg. Grade (3) hypertension is a systole of blood pressure 180mm Hg or more or a diastole110mm Hg or increase and isolated systolic hypertension means systolic pressure equal or higher 140mm Hg and a diastolic pressure equal or higher 90mm Hg. Hypertension can be managing or controlling by pharmacological as antihypertensive medication or nonpharmacological through life style modification and alternative therapy as ginger, which is one of most substitute method that offers several health benefits.

The use of herbs or medicinal plants in the treatment of diseases worldwide dates back to prehistoric times. One of the earliest records of the use of herbal medicine is that of Chaulmoogra oil from the species of Hydro carpus Gareth, which was found to be effective in the treatment of leprosy.

Ginger contains many cations and anions, such as calcium, magnesium and phosphorus and it has a function in bone development, muscle contraction and nerve conduction. These minerals in ginger are useful for muscle contraction, hypertension, muscle weakness, and seizures. It also contains a great amount of potassium which has a role in the regulation of blood pressure &heartbeat in addition to a study by **Ovulary, et al; in 2014(7)**, who investigated the effect of ginger on the cardiovascular system (CVS), their result showed that significant reduction of systole and diastole blood pressure.

The present study was therefore undertaken to investigate the effect of consumption of ZO on the cardiovascular system (CVS), using changes in heart rate and blood pressure (BP) as the indices.

## SIGNIFICANCE OF STUDY

Hypertension, also known as high blood pressure, is a medical condition where the blood pressure in the arteries is consistently too high. Blood pressure is measured in millimetres of mercury (mmHg) and is expressed as two numbers:

1. **Systolic pressure** (top number): Pressure in the arteries when the heart beats.
2. **Diastolic pressure** (bottom number): Pressure in the arteries between beats.

it is important to maintain blood pressure within normal range or lower the level of high blood pressure, ginger as an herbal therapy can be used under supervision which is low cost and more effective to manage hypertension.

Hypertension, or high blood pressure, is a significant health concern because it can lead to various complications and increase the risk of:

1. **Heart Disease**: Hypertension can cause heart failure, coronary artery disease, and heart attacks.
2. **Stroke**: High blood pressure can lead to stroke, which can result in brain damage or death.
3. **Kidney Damage**: Hypertension can cause kidney failure or chronic kidney disease.
4. **Vision Loss**: High blood pressure can lead to vision loss or blindness due to damage to the blood vessels in the eyes.
5. **Cognitive Decline**: Hypertension is linked to an increased risk of cognitive decline, dementia, and Alzheimer's disease.

## AIM OF THE STUDY

*To determine the effect of ginger on blood pressure among hypertensive patients in Menoufia University.*

## MATERIALS AND METHODS

The study was a randomized safety trial comprised of 60 subjects, 22 males and 38 females, from the Faculty of Basic Medical Sciences. The subjects were in 3 groups of 20 each. Informed consent was given by the subjects and ethical clearance was obtained from the Research Ethic Committee, University of Ilorin

- . **Study setting:** The study was conducted on the 14th of December, 2013 at The University of Ilorin, Kawar state, Nigeria.
- **Extract preparation and administration:** 250gms of rhizomes of ZO was brought from Oja Oba market in Ilorin, Nigeria. The covers were peeled off and the peeled rhizomes washed thoroughly with cold water and allowed to dry. The dried rhizomes were the powdered mechanically, thus made ready for extraction. The product was the transferred to the central tubule of the soxhlet apparatus. The filtrate was concentrated to dryness by using a water bath and a yield of 9.6% (w/w) was obtained. There was a control group and two experimental groups. The control group consumed ordinary water (placebo), while the second and third groups consumed ZO at 100mg/kg of bodyweight and 50mg/kg of bodyweight, respectively.
- **Experimental Groups:** Group A- distilled water Group B- 100mg/kg bodyweight of ZO Group C- 50mg/kg bodyweight of ZO There was a control group and two experimental groups. The Control group consumed

ordinary water (placebo), while the second and third groups consumed ZO at 100 mg/kg of bodyweight and 50 mg/kg of bodyweight, respectively.

- **Selection criteria:** The following criteria were satisfied by each of the selected candidate:

1. Availability and capacity to cooperate adequately during the study
2. Not on any drug medication
3. No exercise 36hrs prior to ZO extract administration
4. No history of cardio-pulmonary disease

- **Ethics:** The ethics committee of The University of Ilorin approved the protocol. Written informed consent was obtained from the participants after comprehensive explanation of the procedure involved.

- **Measurement of heart rate and blood pressure:** The blood pressure was measured using a digital sphygmomanometer (OMRON Health Care, Europe B.V.) and the heart rate was also measured digitally using a digital pulse monitor (OMRON Health Care, Europe B.V.).

- **Statistical Analysis:** The mean values of the measured variables were determined and the standard error of the mean (SEM) were calculated.

The test of significance was determined by using the student's t-test. Differences in means were considered significant at $p<0.05$.

## EFFECT OF GINGER IN HYPERTENSION

**Blood pressure reduction:** Ginger extracts have been shown to decrease systolic and diastolic blood pressure in hypertensive individuals.

1. **Vasodilation:** Ginger's active compounds (gingerol, shogaol) relax blood vessels, improving circulation and reducing blood pressure.
2. **Anti-inflammatory**: Ginger's anti-inflammatory properties may help reduce inflammation-related hypertension.
3. **Antioxidant:** Ginger's antioxidant properties help protect against oxidative stress, which contributes to hypertension.
4. **Calcium channel blockade:** Ginger's compounds may block calcium channels, reducing blood pressure.
5. **Improved blood vessel function:** Ginger enhances endothelial function, improving blood flow and reducing blood pressure.

6. **Potassium channel activation:** Ginger activates potassium channels, helping to lower blood pressure.

7. **Reduced sympathetic nervous system activity:** Ginger decreases sympathetic nervous system activity, contributing to blood pressure reduction.

8. **Improved renal function:** Ginger enhances kidney function, reducing blood pressure.

9. **Reduced aldosterone levels:** Ginger decreases aldosterone, a hormone contributing to hypertension.

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### GINGER FORMS AND DOSAGES

1. Raw ginger: 1-2 inches (2.5-5 cm) per day
2. Ginger powder: 1-2 teaspoons (5-10g) per day
3. Ginger extract: 250-500mg per day
4. Ginger tea: 1-2 cups per day

## Discussion

Uncontrolled hypertension (HTN) is one of the mainly significant public health problems in the world today and it has a significantly high risk to incidence of heart disease, stroke, kidney disease. In the present study, the hypotensive effect of ZO has been established. The study was broadened by the use of two different doses of ZO. ZO has a long history of traditional use. It contains several constituents such as gingerol, gingerol, ginger-Dione, beta-carotene, capsaicin, caffeic acid and curcumin (Kikuzaki & Nakatani; 1996, Schulick; 1996). This study showed a significant decrease in the systolic BP ($p<0.05$), after 2 hrs. and 4 hrs of consumption of 100mg/kg bodyweight of ZO. This dose also caused a significant ($p<0.05$) decrease in the diastolic BP and heart rate, but only after 2 hrs, and not at 4 hrs. This corresponds to findings by Suekawa (1984) and Srivastava (1984) who reported significant hypotension and bradycardia in rats following administration of ZO. On the other hand, consumption of 50 mg/kg bodyweight only caused a significant decrease in the systolic BP after 4 hrs while the heart rate and diastolic BP were not significantly altered following administration of this dose.

## CONCLUSION

In conclusion, human trials for the hypotensive effects of ZO have been few and generally used on low dose with inconclusive results (Nicroll & Tenien; 2009). According to study ginger has very effective effect on lowering blood pressure and hypertension. Research data indicates that ginger its constituents accumulates in the gastrointestinal tract which supports may observation of ginger is effectiveness as an antinausea agent.in summary given has been reported to posses diverse pharmacological properties

## REFERENCE

[1]. P. Schulick, Ginger, Common Spice and wonder drug, 3rd edition. Brattleboro (VT): Herbal Free Press Ltd, 1996

[2]. M. Suekawa, A. Ishiage, K.Yuasa, Pharmacological studies on ginger pharmacological actions of pungent constituents, 6-gingerol and 6-shogaol, Journal of Pharamcology and biodynamic, 7, 1984, 836-48

[3]. K.C. Srivastava, Effect of aqueous extracts of onion, garlic and ginger on platelet aggregation and metabolism of arachidonic acid in the blood vascular system, Prostaglandins, Leukotrienes and Medicine, 13, 1984, 227-35

[4]. B. Egan, R. Schmouder, The importance of hemodynamic considerations in essential hypertension, American Heart Journal, 116(2), 594-599

[5]. A. Fugh-Berman, Dietary supplements in the prevention and treatment of cardiovascular disease, Preventive Cardiology, 2000, 24-32

[6]. M. N. Ghayur, A.H. Gilani, Ginger lowers blood pressure through blockade of voltage dependent calcium channels, Journal of Cardiovascular Pharmacology, 45, 2005, 74-80

[7]. R. Nicroll, M.Y. Henein, Ginger (Zinger offiicinale Roscoe): a hot remedy for cardiovascular disease? International Journal of Cardiology, 131, 2009, 408-9.

[8] National Heart Foundation of Australia. (2016). Guideline for the diagnosis and management of hypertension in adults- 2016, available at heart foundation.org.au

[9] Erem, C., A. Hacihasanoglu, M. Kocak, O. Deger and M. Topbas, 2009. Prevalence of prehypertension and hypertension and associated risk factors among Turkish adults: Trabzon Hypertension Study. J Public Health, 47- 58 :( 1) 31.

[10] Saeed, (2015). Prevalence of hypertension and associated factors in Jalalabad City, Nangarhar Province, Afghanistan. Vol. 4, No.1(2015)| ISSN 2166-7403 (online. DOI 10.5195/cajgh.2015.134 | Available at: http://cajgh.pitt.edu

[11] Marshall, IJ; Wolfe, CD; &McKevitt, C (Jul 9, 2012). "Lay perspectives on hypertension and drug adherence: systematic review of qualitative research". BMJ (Clinical research ed.) 345: e3953. doi:10.1136/bmj. e3953. PMC 3392078. PMID 22777025. Available at: https://en.wikipedia.org/wiki/Hypertension

[12] Chrubasik S, Pittler M, Roufogalis B. Zingiberisrhizoma: a comprehensive review on the ginger effect and efficacy profiles. Phytomedicine2005;12:684701.doi:10.1016/j.phymed.2004.07.009PMID: 16194058

[13] Shelly, T.E, D.O. Melnnis, D.O, Pahio, E & J. Edu, J. Aromatherapy in the Mediterranean fruit fly (Diptera Tephritidae): Sterile males exposed to ginger root oil in pre-release storage boxes display increased mating competitiveness in freed-cage trials, Journal of Economic Entomology, 97(3), 2004, 846-53.

[14] Akinyemi AJ, Ademiluyi AO, Oboh G. Aqueous extracts of two varieties of ginger (Zingiber officinale) inhibit angiotensin Iconvertingenzyme, iron(II), and sodium nitroprusside-induced lipid peroxidation in the rat heart in vitro. J Med Food 2013;