SWAMY VIVEKANANDHA NATUROPATHY AND YOGA MEDICAL COLLEGE

BEETROOT JUICE FOR HYPERTENSION

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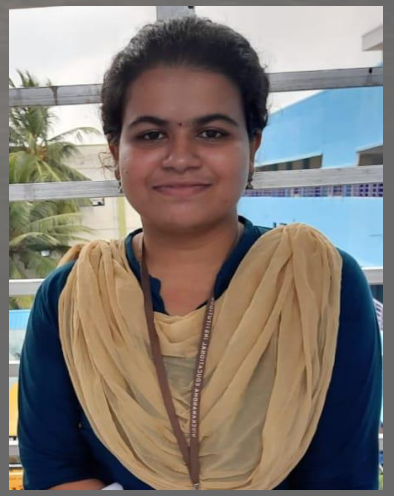


income countries.

WHO , in 2013 ,HBP was the cause of approximately 45% of deaths from heart disease & 51% of stroke, which represents a total of 9.4 million deaths per year.

DEFINITION AND CLASSIFICATION:

Hypertension is a common disease in industrialized countries and accounts for 6% of death worldwide. Epidemiologic studies have revealed that with elevation in systolic and diastolic blood pressure above normal in adult, there is continuous increased risk of Cardiovascular, Stroke and renal disease-cardiovascular risk doubles with every 20mmhg increase in systolic and 10mmhg increase in diastolic blood pressure above normal level.

Normal cut-off value for SBP and DBP are taken as ***<120&<80mmhg*** *respectively.*

Arterial blood pressure is considered elevated at SBP of ***120-129*** *& DBP OF* ***<80mmhg****.*

Arterial hypertension in adult is defined clinically as persistent elevation of SBP ***>130mmhg*** *or DBP OF* ***>80mmhg*** *and graded into stage1 and stage2 as under.*

STAGE1 HYPERTENSION is SBP of ***130-139mmhg*** *or DBP of* ***80-89mmhg.***

Prevalence:

It is widely known that some factors related to diets , such as excessive sodium intake, high consumption of alcoholic drinks, low intake of fruits & vegetables, and a sedentary lifestyle, could increase the prevalence of HBP.

It has also been stated that deficiency of some vitamins such as folic acid, riboflavin, & vitamin C & D can be considered risk factors to develop this non-communicable disease.

AHA[American Heart Assoication] has proven non pharmacological interventions for the prevention and treatment of HBP, especially by means of the reduction of arterial systolic blood pressure, include weight loss, healthy diet, reduced intake of dietary sodium, enhanced intake of dietary potassium, physical activity, & moderation in alcohol intake.

Hypertension is generally classified into 2 types:

Primary or essential hypertension *in which the cause of increase in blood pressure is unknown. Essential hypertension constitutes about 80-95% patients of hypertension.*

Etiology :

1.Genetics factors
2.Racial and environment factors
3.Risk factors modifying the course

Secondary hypertension *in which the increase in blood pressure is caused by disease of the kidneys, endocrine or some other organs. Secondary hypertension comprise remaing 5-20% cases of hypertension.*

Etiology:

1.Renal

a]renovascular

b]renal parenchymal disease

2.Endocrine

a]adrenocortical hyperfunction

b]Hypo&Hyperparathyroidism

c]Oral Contraceptives

3.Coarctation of aorta

4.Neurogenic

BEETROOT

Beetroot[Beta vulgaris] is a nutrient-rich root vegetable also known as beet, table beet.

Beetroots are a great source of fiber, folate, manganese, potassium, iron, and vitamin C .It's distinctive red color is due to the presence of unique pigments called ***Betalains****.*

Phytochemical:

- betalains
- Betanin
- Flavonoids
- Carotenoids
- Phenolic acid

NUTRITIONAL FACTS:[100g]

Energy:44kcal

Carbohydrates:9.6g

Fiber:2.8g

Protein:1.7g

Fat:0.2g

Vitamin B12:0.1mg

Vitamin c:6.7mg

Vitamin B9:110microgram

Potassium:518mg

HOW BEETROOT ACT IN HYPERTENSIVE PATIENT:

Nitrate is present in BRJ which concentrates insaliva & comes into contact with symbiotic bacteria → dorsal surface of tongue

reduce

↓

inorganic NO3-

xanthine oxidase

↓

nitrite[NO2-]

This saliva rich in nitrogen compounds reaches the stomach where a small part of the NO2- is reduced to NO through a non enzymatic reaction, which is favoured by the acidic environment of this organ.

NO3- &NO2- are absorbed by the stomach & duodenum to get into systemic circulation.

20-25% OF NO3- is reabsorbed from the bloodstream & concentrated in the salivary gland to later be a substrate of the bacteria.

This generates a significant increase in the concentration of these ions in the plasma, which favors the production of NO in the wall of bloOd vessels & erythrocytes by employing reduction mechanisms of an enzymatic nature & non enzymatic nature.

In this way, the increase in NO concentration promotes vasodilation through different cellular mechanism[e.g.{cGMP}/ relaxation after activation of k+ channels]& it is associated with a significant decrease in BP to muscle relaxation in the endothelium.

BENEFITS:

Regular consumption of beetroot may help to reduce the risk of heart disease by lowering blood pressure, improving blood lipid profiles and preventing platelet aggregation.

Nitric oxide production:

Nitrate

Nitric oxide

dilate blood vessels and **LOWERING BLOOD PRESSURE.**

So, It's given for **hypertension.**

Beetroot's antioxidants and polyphenols have anti-inflammatory effects, which can help to reduce inflammation in the body.

Improved endothelial function:

It has antioxidants and polyphenols help to improve endothelial function, which is critical for maintain healthy blood vessels and regulating blood pressure.

Conclusion:

BEETROOT Juice supplementation ,ightbe an easy accessible, safe, &evidence based stated to reduce Blood pressure. This supplementation has a great potential to reduce SBP & DBP valuesin bothhealthy subjects & those with cardiovascular risk. The most probable mechanism is the NO3-/NO2-/NO pathway, although more research is required to establish if other secondary metabolites of BRJ may mediate the effects[e.g. betalins].

This reduction in BP, especially SBP, not only would decrease morbidity and mortality, but it would also decrease public health expenditure.

Research study:

RESEARCH ARTICLE

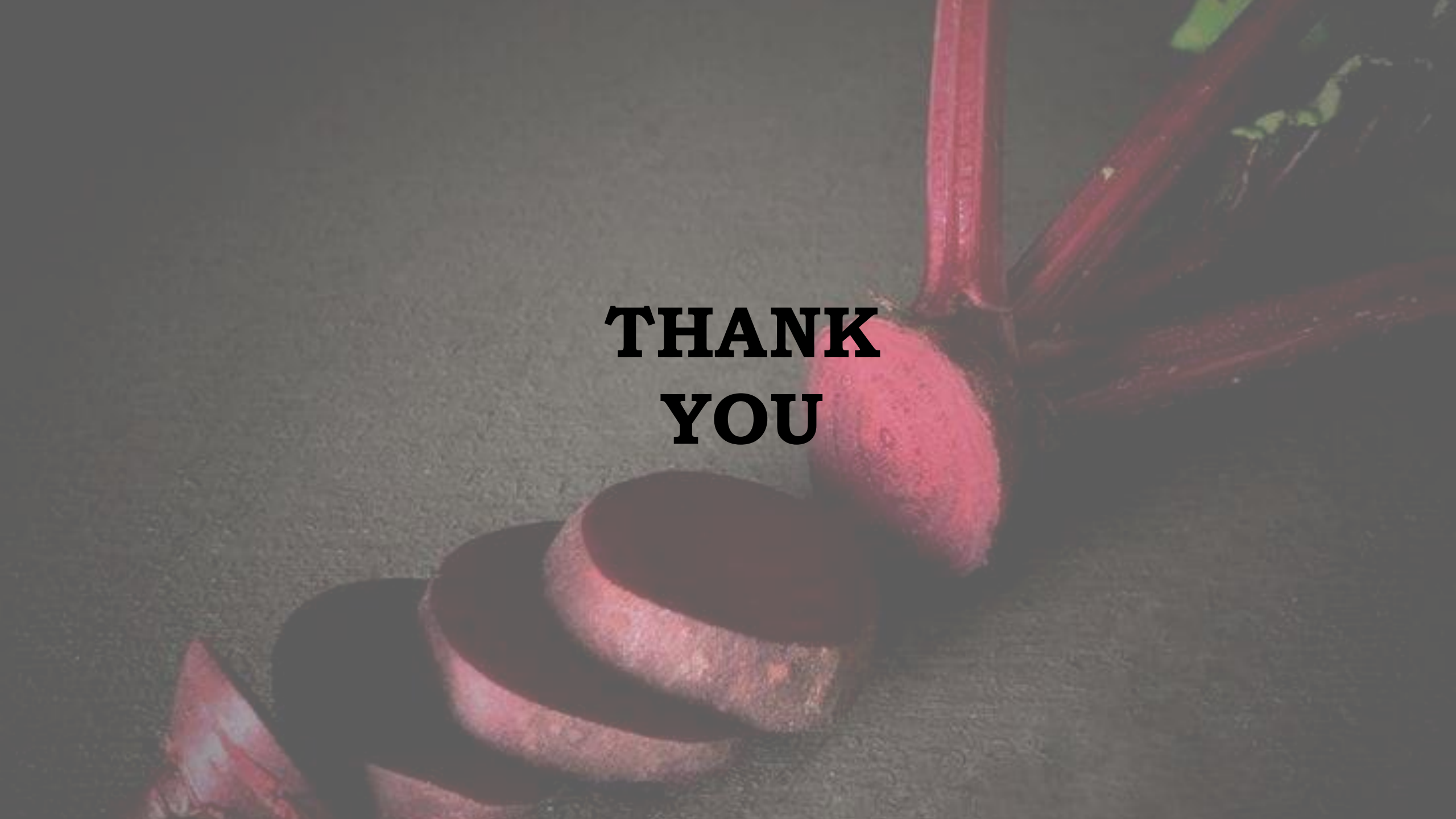
Dietary nitrate from beetroot juice for hypertension.

Author: Diego A Bonilla Ocampo

Abstract

According to current therapeutic approaches, a nitrate-dietary supplementation with beetroot juice (BRJ) is postulated as a nutritional strategy that might help to control arterial blood pressure in healthy subjects, pre-hypertensive population, and even patients diagnosed and treated with drugs. In this sense, a systematic review of random clinical trials (RCTs) published from 2008 to 2018 from PubMed/MEDLINE, ScienceDirect, and manual searches was conducted to identify studies examining the relationship between BRJ and blood pressure. The specific inclusion criteria were: (1) RCTs; (2) trials that assessed only the BRJ intake with control group; and (3) trials that reported the effects of this intervention on blood pressure. The search identified 11 studies that met the inclusion criteria. This review was able to demonstrate that BRJ supplementation is a cost-effective strategy that might reduce blood pressure in different populations, probably through the nitrate/nitrite/nitric oxide (NO_3^-/NO_2^-/NO) pathway and secondary metabolites found in *Beta vulgaris*. This easily found and cheap dietary intervention could significantly decrease the risk of suffering cardiovascular events and, in doing so, would help to diminish the mortality rate associated to this pathology. Hence, BRJ supplementation should be promoted as a key component of a healthy lifestyle to control blood pressure in healthy and hypertensive individuals. However, several factors related to BRJ intake (e.g., gender, secondary metabolites present in *B. vulgaris*, etc.) should be studied more deeply.

Keywords: Beta vulgaris; blood pressure; dietary supplements; hypertension; nitric oxide.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