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Pharma Sci-Are Nutraceuticals Effective in Controlling Essential Hypertension? - Antoine Al-Achi- Campbell University

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Introduction:

According to the U.S. Centres for Disease Control and Prevention (CDC), the prevalence of essential hypertension (adults, 20 years of age or older) in the U.S.A. was estimated to be 33.5% (2013-2014 data), with an estimated death rate of 9.5 per 100,000 due to this illness. The CDC reports also state that the occurrence of this disease in the population varies by age, gender, and ethnicity. Older persons, males (up to the age of 45 years), and African-Americans suffer from this condition the most. Treating hypertension with antihypertensive drugs has been the mainstay for managing individuals with this condition. Surveys in the U.S.A. have shown that clinician's choice for selecting a particular antihypertensive medication was not correlated with age, gender, ethnicity, or the medical insurance the patient had. Moreover, the most prescribed medications were (in descending order) angiotensin-converting enzyme inhibitors, thiazide diuretics, angiotensin receptor blockers, calcium-channel blockers, and betablockers. It is interesting to note that hypertension and osteoporosis, both are frequently encountered in older patients, share similar risk factors of genetic predisposition and environmental conditions. Moreover, antihypertensive medications can influence positively or negatively, the bone mineral density in patients with osteoporosis. In this editorial, the use of some nutraceuticals by patients suffering from essential hypertension is discussed.

L-arginine is an amino acid that was shown to cause a reduction in blood pressure in experimental animals and clinical studies following oral or intravenous administration. L-arginine reduces blood pressure by enhancing the production of Nitric Oxide (NO) which in turn yields to endothelium smooth muscle relaxation.

Beetroot (Beta vulgaris) is highly rich in nitrate and was shown to cause a reduction in blood pressure via NO vasodilatory action.

Calcium, as a mineral, is a highly critical regulator for many bodily functions. When the calcium level in the body is high, it yields to enhanced sodium excretion which results in a decreased intravascular volume. HLs lower volume produces a reduction in blood pressure through a lowering of intravascular resistance.

Celery (Apium graveolens L.) is a good source of magnesium. The active constituent in celery that was shown to cause a reduction in blood pressure was n-butylphthalide.

Garlic (Allium sativum) was shown to reduce blood pressure in patients with high blood pressure, and its effectiveness was as powerful as those of anti-hypertensive medications. The mechanisms of action of garlic in reducing blood pressure, mainly due to the components allicin and S-allyl cysteine, are numerous and include NO regulation as well as calcium channel blocking action.

Hawthorn (Crataegus laevigata) extract was shown to reduce diastolic, but not systolic, blood pressure in patients who had Type 2 diabetes.

Magnesium intake in the diet was found to associate with lower blood pressure levels.

Olive leaf (Olea europaea) extract is known in traditional medicine around the world to combat hypertension. The hypotensive action of olive extract is perhaps through a Ca2+ channel antagonistic effect.

Treatment plan for a patient in ICU is quite complicated as doctors from different specialities take part in it with advanced methods and machines. But the intensive treatment and diseases of the patient also has complications in itself.

This work is partly presented at World Congress on Advances in Pharmaceutical Sciences

Potassium supplementation was shown in clinical studies to reduce diastolic and systolic blood pressure in a dose-dependent manner primarily through a vasodilatory action. Fruits and vegetables are usually a good source of potassium in the diet.

Taurine is an amino acid that was shown in clinical trials to lower diastolic and systolic blood pressure by enhancing endorphin production and lowering epinephrine serum levels.

There are a number of effective antihypertensive diet interventions, such as the DASH (Dietary Approaches Commonly Used to Stop Hypertension) diet, which advises high consumption of vegetables, fruits and whole grains, while limiting consumption sweets, sugary drinks, and red meat. The most recent meta-analysis of clinical trials examining the DASH diet demonstrated a decrease in systolic BP of 5.2 mmHg and 2.6 mmHg diastolic. These reductions are significant, as a decrease in systolic BP of 5 mmHg is associated with reductions in mortality of 14% from stroke, 9% from heart disease and 7% from all causes. Unfortunately, even if this approach has proven to be beneficial, few patients are able to systematically follow this rigorous diet. In a recent study of 4,386 patients trying to eat according to the DASH diet, only 22% of patients were able to adhere to it.

Vitamin C reduces blood pressure through NO retention.

Vitamin D serum levels are found to be inversely correlated with the prevalence of hypertension in the population. Moreover, high serum levels of this vitamin correlate well with lower diastolic blood pressure readings.

Vitamin E increases the production of NO by potentiating the activity of nitric oxide synthase.

In summary, strong evidence in the literature supports the use of nutraceuticals in the management of hypertension. However, since uncontrolled hypertension can lead to major health complications and even to death, patients with hypertension must coordinate their use of nutraceuticals with their physicians to maximize the health benefits of these products.

References

1. https://www.cdc.gov/nchs/fastats/hypertension.htm
2. https://www.cdc.gov/bloodpressure/facts.htm
3. Shah SH, Stafford RS (2017) Current trends of hypertension treatment in the United States. Am J Hypertens
4. Ilic K, Obradovic N, Vujasinovic-Stupar N (2012) The Relationship Among Hypertension, Antihypertensive Medications, and Osteoporosis: A Narrative Review. Calcified Tissue International 92: 217-227.
5. Chen ZY, Peng C, Jiao R, Wong YM, Yang N (2009) Anti-hypertensive nutraceuticals and functional foods. J Agric Food Chem 57: 4485-4499.
6. Turner JM, Spatz ES (2016) Nutritional supplements for the treatment of hypertension: A practical guide for clinicians. Curr Cardiol Rep 18: 126
7. Khosh F, Khosh M (2001) Natural approach to hypertension. Alter Med Rev 6: 590-600.
8. Tashakori-Sabzevar F, Razavi BM, Imenshahidi M, Daneshmandi M, Fatehi H, et al. (2016) Evaluation of mechanism for antihypertensive and vasorelaxant effects of hexanic and hydroalcoholic extracts of celery seed in normotensive and hypertensive rats. Revista Brasileira de Farmacognosia 26: 619-626.
9. Walker AF, Marakis G, Simpson E, Hope JL, Robinson PA, et al. (2006) Hypotensive effects of hawthorn for patients with diabetes taking prescription drugs: a randomized controlled trial. Br J Gen Pract 56: 437-443.
10. Ali Hashmi M, Khan A, Hanif M, Farooq U, Perveen S (2015) Traditional Uses, Phytochemistry, and Pharmacology of Olea

europaea (Olive). Evid Based Complement Alternat Med pp: 1-29.

11. Houston MC (2011) The Importance of Potassium in Managing Hypertension. Curr Hypertens Rep 13: 309-317