

Use of Vegetable Mixture and Decoction of Some Vitamin C enriched Plants to Manage Hypertension in Jos, Nigeria: A Case Report

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Abstract

High blood pressure (HBP) increases the risk of cardiovascular disease (CVD) globally. This contributes to increase in morbidity and mortality of humans. This case study aims to add to the contribution of life style and diet to the control and modulation of HBP hypertensive or normotensive individuals. This case has shown that BP was reduced from 142/92mmHg to 124/74mmHg in 1hr and to 116/64mmHg in 24hr after eating vegetable and fruits decoction mixture unlike the drugs used under this case that reduced BP from 137/90mmHg to 123/80mmHg in 1hr and increased to 142/92mmHg after 24hr. This important role of vegetable and fruit decoction in the modulation of BP in this case shows that Jos-Nigeria has potential vegetables and fruits that when harnessed as food can serve as herbal remedies for hypertension as a result of vitamin C enrichment.

Keywords: hypertension; herbal remedy; vegetables;fruits; vitamin c

Introduction

The use of fruits and vegetables has been advocated by WHO and other disease control agencies for the prevention and management of non-communicable disease including hypertension [1]. There is no doubt that high intake of vegetables and fruits has been associated with lower risk of hypertension and the associated challenges [2].

It is a fortunate situation in Africa where natural/herbal remedies are very common as fruits, vegetables or plants [3 - 5]. Luckily, the global healthcare body, WHO supports such herbal remedies [6].

Plants, fruits and vegetables are major sources of Vitamin C [7,8]. Utsugi *et al* [9] showed that Vitamin C, Potassium, fruits and vegetables when consumed in high-level significantly lowers risk of hypertension. Evidence are many to show that dietary factors show preventive and management tendencies in the modulation of blood pressure among hypertensive or normotensive persons [10,11]. The cardioprotective and multiple beneficial effects of vegetables and fruits may be due to very high content of vitamins, fibre, minerals (especially potassium, and magnesium), phytochemicals (like polyphenols and carotenoids), antioxidants and other components [12].

Basically, management of hypertension involves the combination of some antihypertensive drugs. This conventional drug administration have not totally cured hypertension but for moderation and control [13].

This case study aims to present and educate healthcare professionals, caregivers and hypertensive patients of the use of vegetative and fruits decoction for the management of Hypertension.

Case presentation

A certain married man of age 46 years in Jos was diagnosed of hypertension in a hospital in Jos. He presented with the following symptoms: general body weakness, cough, left chest pains, less active left hand and head ache. He is tall and about 177cm and body weight of 80kg. While in hospital, he was commenced with Ulcer treatment and with adequate drugs to reduce general body pains. Some of the presentation, Tests and management protocols are shown in **table 1**. Some diagnosis such as ECG (**Figure 1**), X-Ray, Full blood count and Malaria tests were done.

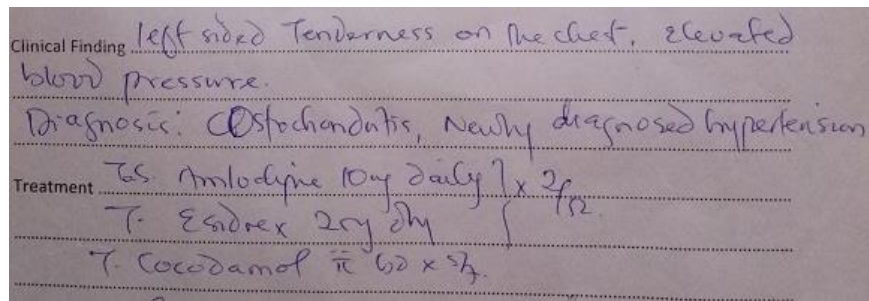
Figure 1.



ECG Diagnosis of Case patient

Though the ECG showed normal, X-Ray indicated hypertension, the blood counts showed results within normal range and without Malaria. The Doctor

in his comments (**figure 2**) showed Costochondritis, newly diagnosed of hypertension and placed on the drugs in the **figure 2**.



Doctor's Note on the Case Patient

The patient was admitted, managed and discharged after 4 days to continue with the treatment with drugs listed in the Figure 2 at home.

The case concentrated on the homecare and BP measurement using Omron (M2 Basic) BP monitor which is a semi-automated device using cuff-oscillometric method [14].

The essence of this cases study is to narrate the happenings within the BP treatment at home especially with drugs and diet. As at the 7th day, at exact time (24hrs) to take drugs in figure 3A, the BP was 137/90mmHg (figure

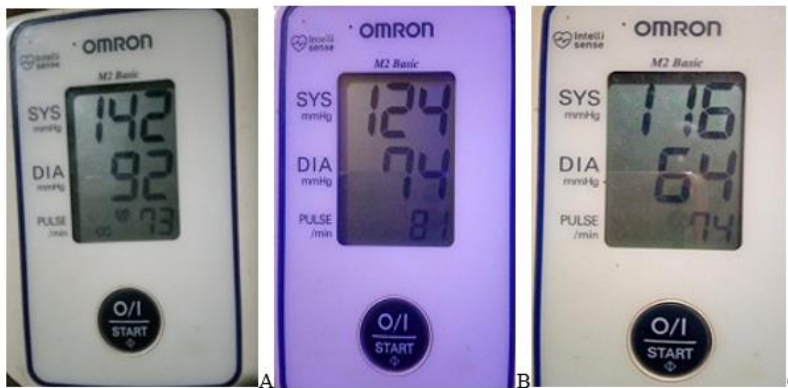
4A) and after 1hr of taking the drugs, the BP was 123/80mmHg (figure4B). When the drugs (figure 3A) were skipped on the 8th day for 1hr after 24hrs, the BP rose a little higher than normal (147/97mmHg) as seen in figure 5A. The vegetable and fruits decoction (figure 3B) was taken with enough water and BP was checked after 1hr (figure5B) and the BP was normalised to 124/74mmHg. The patient skipped the drugs for that day and checked the BP 1hr after 24hrs of the vegetable consumption (figure 5C) and the result is far better than what the drug offered. The vegetable and fruit diet was further used as home remedy and the summary is put in **table 1**.



Conventional BP Drugs and Vegetable and Fruits Decoction used in the Case



BP Readings at exactly 24hr and 1hr after Drugs Intake in the Case



BP Readings at exactly 25hr After Drug Intake, 1hr and 25hrs after Vegetable Decoctions Intake in the Case

	Day – Date	Noticed Signs and Symptoms	Test/ Result	Diet/Food	Treatment
1	Day1-20/01/24	Left sided chest pains, Body weakness, head ache, loss of appetite	Temperature-36.5°C BP- 170/120mmHg O ₂ saturation-Normal	Pap and biscuit	Cocodamol (2 Tablets 2 times daily); Omeprazole IV, Normal saline infusion
2	Day2-21-01/24	No difference	Temperature-36.5°C BP- 150/110mmHg O ₂ saturation-Normal X-Ray-Indication of HBP, ECG-Normal Malaria-Not seen FBC-All Normal	Tea and Bread, 5 Alive Juice, Jollof Rice Water	Same as above;
3	Day3-22-1/24	Reduction in pains, others remained	Temperature-36.5°Cf BP- 140/110mmHg O ₂ saturation-Normal	Tea & Biscuit, Pounded yam with vegetable soup, water	Cocodamol (2 Tablets 2 times daily); Esidrex 25mg daily, Amlodipine 5mg daily
4	Day 4-23/01/24	Reduction in chest pains, headache and cough	Temperature-36°C BP- 120/80mmHg O ₂ saturation-Normal	Same as above	Same as above
5	Day 5-24/01/24	Same as above	BP- 130/90mmHg	Same as above	Cocodamol (2 Tablets 2 times daily); Esidrex 25mg daily, Amlodipine 10mg daily
6	Day 6-25/01/24	Stable and normal	BP- 125/85mmHg	Pap & Akara Okro soup and Akpu	Same as above

				Water	
7	Day 7-26/01/24	Same as above;	BP-137/90mmHg at 24hrs 123/80mmHg at 1hr after drug	Same as above	Same as above
8	Day 8-27/01/24	Same as above	BP at 1hr after expected time of drugs- 142/92mmHg and 1hr after vegetable decoction- 124/74mmHg	Jollof Rice Vegetable and fruits decoction	No drugs
9	Day 9-28/01/24	Same as above	BP at 24hrs after vegetable decoction)- 116/64mmHg	Same as above	Same as above
10	Day10-9/01/24	Same as above	BP-120/78mmHg	Same as above	Same as above

Discussion

COVID-19 pandemic escalated the use of home remedies especially with the Vitamin C enriched plants and vegetable [15-18]. No doubt the reason of consideration of the use of home remedies and testing BP monitor (Omron®) for the purpose home monitoring of the treatment outcomes in this case.

In this case, the vegetable and fruits decoctions were composed of Lettuce, Cabbage, Onions, Carrot, Garden egg, Tomatoes, Green pepper, Groundnut cake and Moringa. The decoction is uniformed mixed and served as food for the day. Some studies have mentioned one or more of the mentioned components of the decoction to have a beneficial effect towards HBP management [10,11], as anti-oxidants [18,20] and as vitamin C enriched plants [15,16]. This case supports the research outcomes of Utsugi and colleagues [9] and Aune *et al* [12] as it clearly indicated that BP was reduced from 142/92mmHg to 124/74mmHg in 1hr and to 116/64mmHg in 24hr unlike the drugs used under this case that reduced BP from 137/90mmHg to 123/80mmHg in 1hr and increased to 142/92mmHg after 24hr.

It is important to highlight some contributions of the vegetable and fruits components that could be associated with management of hypertension. Lettuce is a leafy green vegetable that is low in calories and high in nutrients. It contains minerals like potassium and magnesium, which help regulate blood pressure by promoting healthy blood vessel function and reducing sodium levels. Cabbage is rich in fiber, vitamin C, and antioxidants. It has a good amount of potassium, which can counterbalance the effects of sodium and support healthy blood pressure. Onions contain a compound called quercetin, which acts as a natural diuretic. This helps reduce fluid retention and lower blood volume, contributing to healthy blood pressure levels. Carrots are a great source of beta-carotene, which converts to vitamin A in the body. And Vitamin A supports cardiovascular health and may help maintain healthy blood pressure. Garden egg is a good source of dietary fiber, potassium, and antioxidants. The potassium content helps counterbalance the effects of sodium, while the antioxidants protect against oxidative stress, which can contribute to hypertension. Tomatoes are rich in lycopene, an antioxidant that has been associated with a reduced risk of hypertension. Lycopene helps relax blood vessels, improve blood flow, and lower blood pressure. Green peppers are an excellent source of vitamin C and other antioxidants. Vitamin C supports a healthy cardiovascular system and may have a positive impact on blood pressure regulation. Groundnut cake, or peanut cake, is a good source of protein, healthy fats, and fiber. Moringa is a nutrient-dense plant that contains various vitamins, minerals, and antioxidants. It is particularly rich in potassium, which helps balance sodium levels and support healthy blood pressure. These liturgy of contributions of the decoctions are useful in hypertension control and supports earlier works [21-25].

This case study should be a stimulus towards encouraging local remedies inform of vegetables and fruits decoction and herbal / natural means of HPB control and management. This case however is in line with Dietary Approaches to Stop Hypertension (DASH) trial, that posited that multiple vegetable and fruit intake significantly reduced BP [26-28]. It is also in agreement HBP patients dietary change agenda to prevent the onset of hypertension, and as well reduce the risk of hypertension related clinical complications [29] unlike those who continued with their regular diet or processed foods [30, 31].

On the other way round, the economic implications of the use of conventional BP drugs and Vegetable and fruits decoction should be analysed for clarity on the more economic friendly management in this high cost of living economy in Jos-Nigeria. Also, the patients who would like the dietary change approach should be mindful of the vegetable and fruits hygiene ta avoid parasites and other associated challenges [32, 33].

This case can stimulate Pharmacists and Pharmaceutical research towards a more robust research and better ways to formulate and package drugs related products that can be used to manage hypertension challenges at local or individual levels.

Though this HBP case might be limited by other factors such as diet, conventional drugs, extent of rest and for the sake of just one case recorded, there is a need for further studies where multiple participants are used.

This case is an eye opener towards dedicated use of vegetables and fruits decoctions for control and management of Hypertension. The mechanism of actions of these vegetables and fruits decoctions are not known. However, the Vitamin C component is very high and may be working in line with Vitamin C action in high doses for diseases conditions and normal body functions [34, 35].

Conclusion

Hypertension as indicated by high blood pressure (HBP) lead to the increased risk of cardiovascular disease (CVD). This has contributed to increased morbidity and mortality. Life style and diet could contribute effectively to control and modulation of HBP hypertensive or normotensive individuals. This has been elucidated by this case study

This important role of vegetable and fruit decoction in the modulation of BP in this case shows that Jos-Nigeria has potential vegetables and fruits that when harnessed as food can serve as herbal remedies for hypertension as a result of vitamin C enrichment.

The vegetables such as Lettuce, Cabbage, Onions, Carrot, Garden egg, Tomatoes, Green pepper, Groundnut cake and Moringa when combined and

eaten as food otherwise called “Genye delicacy” can substitute or have a synergistic effect on hypertensive individuals. Genye could be an emerging Hypertensive medication away from the conventional hypertensive therapies.

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Competing interests

The authors declare no competing interests. The authors are not also interested in the product patency but to save lives in Nigeria and across the globe.

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