

A review of the DASH plan in Nigeria.

Ogunkoya OE¹, Besidonne CE^{2*}

¹Medical School, Olabisi Onabanjo University, Sagamu, Ogun State, Nigeria

²The Ingenuity Lab, University of Nottingham, Nottingham, United Kingdom

Abstract

High blood pressure, known also as hypertension has become an increasingly prevalent medical condition in Nigeria over the last decade and as a condition which is often associated with other clinical illnesses, relevant measures towards controlling its effects have been developed globally.

This review, which involved the use of relevant academic literature, looks at one of the major advancements in lifestyle medicine that has been in use for more than two decades and views its application with the current situation in Nigeria. Controlling the disease through dieting particularly DASH is considered a major advancement in the field of clinical Nutrition. DASH involves the development of a moderate carbohydrate eating plan combined with the recommended intake of vegetables and fruits to supply relevant macro and micro nutrients necessary to alleviate hypertension. Although, currently being used in Nigeria by dieticians and clinical nutritionists, several public health challenges have continuously hindered the country from reaping the full benefits of the DASH plan. Some of these challenges include the dissemination and interpretation of plans by care givers and patients, the strict adherence to plans formulated by clinical nutritionists, economic constraints, as well as the lack of expertise in the formulation of DASH plans for patients in Nigeria. Recommendations are made as to how best such challenges can be overcome, including working with patients considering their literacy levels, counseling methods and using the Patient Record Card (PRC) to manage the adherence and compliance to formulated DASH plans.

Keywords: Hypertension, DASH, Nutrition, Nigeria.

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Introduction

Hypertension and its woes

The world health organization defines hypertension as a disease condition in which the blood vessels have a constantly raised pressure caused by an increased force of blood flow against the walls of the circulatory system particularly the arteries. The pressure within the blood vessels is clinically measured in millimeters of mercury (mmHg) as two numbers i.e. a systolic pressure over a diastolic pressure from the beating and relaxation of the heart between beats. Measurements of blood pressure are essential to the diagnosis and monitoring of hypertension, which is an indicative primary risk factor for the development of Cardiovascular Disease (CVD) in patients. It is therefore significant in clinical and public health medicine.

CVD is typically known to occur in middle age or elderly patients, but the risk factors for developing CVD are determined to a great extent by behaviors learned in childhood and carried on into adulthood such as dietary habits [1]. With stroke being cited as the leading cause of death and disability in Nigeria causing up to half of neurologic based admissions and medical deaths as high as 17% [2] hypertension has been identified in recent studies as one of the most common risk factors for developing strokes [3].

Hypertension which is often termed a silent killer has neither warning signs nor symptoms. It tends to last a lifetime, and uncontrolled situations can lead to more severe conditions such as heart and renal diseases, stroke and even blindness [4]. Lifestyle adjustments have been put forward and are constantly advocated for in managing, treating, preventing and controlling hypertension [5]. Such lifestyle behaviors which can be adopted include healthy dieting, weight control, increase in physical activities, and quitting habits such as smoking and excessive alcohol consumption [6-8]. Evidence in scientific literature indicates that individuals can actively control hypertension without medication, using a healthy diet, suggesting long term positive influence in reducing cardiovascular risks that result from hypertension [9,10].

The DASH Plan: Dietary Approaches to Stop Hypertension

Advancements in clinical nutrition led to the development of a Dietary Approach to Stop Hypertension (DASH) diet. These dietary approaches to dealing with hypertension are moderate carbohydrate eating plans that emphasize on an increased intake of vegetables, fruits and low fat dairy products, with the simultaneous reduction in the consumption of products with high saturated fat content, cholesterol and total fat including red meats, sweets and other types of added sugars [11]. It emphasizes the intake of foods rich in certain nutritional

content such as proteins, high fiber foods, and those rich in macro nutrients like as potassium, calcium, and magnesium such as beans, whole grains, nuts and other low-fat dairy products [4].

Two Studies conducted by Research Scientists who received support from the National Heart, Lung, and Blood Institute (NHLBI) in Maryland, USA focused on the use of DASH in the control of blood pressure among patients. Their findings revealed significant reduction in blood pressure⁴, with an indication that the diets caused reductions of Systolic and Diastolic Blood Pressure (SBP and DBP) with values of 5.5 mmHg and 3.0 mmHg respectively. As shown to be a significant method of reducing blood pressure, DASH is not entirely based on sodium reduction in diet, although its effects can also be enhanced by lowering sodium in the diet [11].

The DASH approach has also been shown to be effective in improving cardiovascular health among a wide range of populations and these advantages can be attributed to the presence of various micronutrients which help improve metabolic risk [12] Low-Density Lipoprotein (LDL) cholesterol [13], and insulin insensitivity [14]. Serum homocysteine levels are also impacted by modifications of dietary patterns with DASH dieting, improving risk factors linked to the development of cardiovascular disease and stroke [1].

Challenges of the DASH Diet in Nigeria

Despite the various commendations surrounding the DASH diet through research and surveys cited in Steinberg editorial [15-17] the underutilization of DASH diet has been shown among tens of millions who are either hypertensive or prehypertensive. Poor adherence to a strict DASH diet is a major challenge to the effectiveness of the diet. Improved adherence can be achieved when the underlying causes of poor adherence are understood [17]. In 2003; a study projected that close to 400000 cardiovascular diseases could be prevented during the space of a decade if hypertension individuals were fully compliant with DASH diet [18].

As stated by Steinberg et al. the dissemination as well as translation of nutritional information relating to DASH diets [17] continues to be a major public health issue and this can be related to the Nigerian dietary context. With regards to diet index, on DASH plans, the difficulty in interpretation and a low understanding of nutritional facts labeled on foods can indirectly make patients go for more harmful foods that exceed or limit the daily requirement of vitamins and nutrients [19]. A practical example as seen is in the multipronged approach to treating stroke in Nigeria where cultural barriers interfered in the interpretation of nutritional information. 16 Care givers' and family members' understanding of the DASH diet also has a major role to play in adherence, as high levels of family support enhance a better outcome for hypertensive patients [20-22] In terms of interpretation, it is noteworthy to consider that the adult literacy rate of any indigenous language in Nigeria is about 71.6% and the English Language literacy level of 56% 22 contributing to the challenges.

Also, economic constraints cannot also be overlooked when discussing the increased prevalence of cardiovascular disease and low adherence to DASH dieting in Nigeria. Increasing the prescription of lifestyle intervention in the regulation of high blood pressure is largely opposed due to the current economic situation [23]. Often, the health budget in Nigeria is way below the recommended figures suggested by World Health Organization and the International Monetary Fund. US\$217 was recorded as the per capita health expenditure as compared with US\$9403 of the United States of America using latest WHO figures [24]. As a country within the low-middle income (LMIC) class with a population of approximately 173.6 million people [22,25] personal income or income from family members are used to finance medical bills of about 80% of the population [26,27].

Socioeconomic factors such as educational level and employment also play a pivotal role. Working with the DASH score of hypertensive individuals, higher income individuals tend to have a much greater intake of saturated fat, cholesterol, total fat and sodium than individuals with low income. Also, the intake of recommended macro nutrients such as calcium, magnesium potassium, and even proteins is higher among this class. In several studies, it is also noted that individuals with lower education level have negative DASH accordance scores and those with the highest educational level have positive accordance DASH scores [28].

As cited previously that DASH is not basically a low sodium intake diet even though, the dietary effects can be improved through low sodium intake, clinicians however, are known to primarily recommend sodium reduction in hypertension management during dietary counseling [29]. Furthermore, as many clinicians complain of limited time during dietary counseling, the extent of their knowledge and familiarity with DASH diet within Nigeria is unknown [29].

Poor record keeping is also one of the most significant challenges that come with patient care management. This, in turn, makes adequate follow up almost impossible to achieve. The Patient Report Cards (PRC) lack columns for vital information that can help the dietician follow up on clinical information at a single glance saving time. For example, a constraint column which is absent on most PRCs can help during counseling sessions to discuss barriers limiting adherence to the DASH diet [30] Patient's reasons for missing appointment times and date have been studied and is often documented as either confusion of the location, date and time or forgetting of appointments [31] Outpatient delivery of effective healthcare is largely affected negatively by failure to attend relevant follow-up appointments [32]. Without history of records of subsequent visits on the PRC, all these cannot be regulated [30].

The Way Forward

It is noteworthy to know that DASH dietary plan used along with other lifestyle recommendations such as increased participation in physical activity; moderate alcohol consumption and taking prescribed medications can effectively prevent and control blood pressure [33]. Also, the best way to

start a DASH plan is to make one with the physician or dietician based on the required daily calorie level.

Although there is improvement in the number of government agencies getting involved in promoting health through lifestyle changes. However, due to the emerging trend of more numbers of people affected by Non-Communicable Diseases (NCD's),

Nigeria will need to devise several ways of combating NCDs [34,15] with the dwindling resources of the national healthcare budget and the low population figures covered by the National Health Insurance Scheme (NHIS) [35]. Table 1 below explains the importance of each food item, the nutrients found in them and the amount to take based on the daily calorie level.

Table 1. It explains the importance of each food item, the nutrients found in them and the amount to take based on the daily calorie level.

The DASH diet				
Food group	Daily servings	Size of serving	Examples with notes	Food group significance in the DASH eating plan
Grains	7-8 servings	1 oz dry cereal½ cup cooked rice, pasta, or cereal, 1 slice bread,	Rice, spaghetti, oats, amala, fufu, cereals, whole wheat bread, popcorn, bagels, crackers	These provide the major energy and fibre sources
Vegetable foods	4-5 servings	½ cup cooked vegetables, 6 oz vegetable juice, 1 cup of raw leafy vegetables	Ewedu (Corchorus), tomatoes, Ugwu (Telfaria), Scent leaves (Ocimum), Carrots, green peas and broccoli, Moringa leaves and seeds, spinach, sweet potatoes, potatoes	These serve as adequate sources of fibre magnesium and potassium
Fruits	4-5 servings	6 oz fruit juice ¼ cup dried fruit ½ cup fresh, canned or frozen fruit, 1 medium sized fruit	Apple, tangerines, oranges and/or orange juice, grapes, grapefruit and/or grapefruit juice, bananas, mangoes, peaches, pineapples, watermelons	These serve as adequate sources of fibre magnesium and potassium
Dairy products (Low-fat or Fat-free)	2-3 servings	1.5 oz of cheese 8 oz of milk, 1 cup of yogurt,	1% Low-fat or Skim milk, frozen or low-fat yoghurt, fat-free cheese, fat-free buttermilk	These serve as adequate sources of protein and calcium
Animal protein (Meats/poultry/ fish)	2 servings or less	3 oz of cooked poultry meats, or fish	Use lean portions only; cut out visible fat; boil rather than frying, roast; take off skin from poultry products	These serve as adequate sources of fibre magnesium and potassium
Dry beans, Seeds and Nuts	4-5 servings per week	½ cup cooked dry beans and peas, 1.5 oz or 1/3 cup of nuts ½ oz or 2 tbsp. of seeds	Kidney beans, almonds, groundnuts, mixed nuts, walnuts, cashew-nuts, sunflower seeds, lentils	These serve as adequate sources of fibre, energy, magnesium, protein and potassium
Fat products and oil†	2-3 servings	1 tbsp. low-fat mayonnaise, 1 tbsp. soft margarine, 2 tbsp. light salad dressing, 1 tbsp. vegetable oil	Light salad dressing, low-fat mayonnaise, vegetable oils (olive, corn, or canola), soft margarine	27% of DASH calories come from fat, including additions to foods
Sweet products	5 servings per week	1 tbsp. sugar, jelly or jam, ½ oz of jelly beans, 8 oz of lemonade	Fruit punch, sugar and jam products, fruit flavoured products including gelatine, candy, jelly, lemonade	Sweets should contain low-fat

Equals ½–1¼ cup, depending on the type of cereal. Best to check the nutrition label on the product. † Fat content of product changes the serving counts for fats and oils. For example, 1 tbsp. of regular salad dressing equals one serving; 1 tablespoon of a low-fat dressing equals ½ serving; 1 tbsp. of a fat-free dressing equals zero servings.

Registered dieticians are in a more suitable position to provide counseling to the patients in and out of the hospital on the DASH diet [36,37] stating emphatically the importance of the intervention of each nutrient in regulating blood pressure. However, in areas with no dieticians, trained nurses (although they do not have the license to prescribe medications) [38] can be trained by educating them both in training and continuing medical education [39]. This is a better way to handle the poor physician to patient ratio [35] in Nigeria. Physicians with the knowledge of medical nutrition should be researched on to ascertain the extent of their proper understanding of DASH diet.

Patient literacy is also suggested to be put into consideration. As there is severe difficulty in adhering to a DASH diet plan without prior understanding of the importance of each food, and the danger of non-adherence when instructions are not given in their mother tongue or native language. It is also advised that counseling and explanation be done in the presence of a family member for strict compliance and accountability, as it was found in a study that patients with a supportive spouse or family member had a better DASH diet score [30]. A general counseling session can be conducted if there are few physicians available for personal counseling. Video delivery [30] could be used during general counseling or

pre-appointment waiting time to sensitize them about what hypertension and stroke is, regulation of blood pressure, the importance and danger of food items, how to strictly adhere to a DASH plan, explanation of food content labels, the essentiality of attending appointments and the use of patient record cards. These should be short videos that drive home the message in illustrative ways.

Short messaging service has also been shown to be very effective in reminding patients of scheduled appointments [17] and it can also be used to improve DASH plan compliance. Although, effectively deploying SMS technology in cultural settings depends on who sends it, using the right context and ensuring the content is right for delivery at appropriate times [30]. Mobile phones and smart phones are now extended to historically disconnected populations and because phones are almost ubiquitous [37] it creates a better opportunity for good follow up on the DASH plan. A study [30] in 2016 recommended that attending physicians are in a better position to send SMS after clinic appointments, while trained nurses occupy a better role to enhance DASH plan follow-up, clinic appointment reminders and post-clinical messages, addressing the lifestyle of the patient.

With respect to purchase cost, it should be known that research has shown that DASH foods can be afforded by low income individuals even at low costs [40]. This should be largely explained to the patients during counseling. Some fruits and vegetables are almost always found readily available in Nigerian markets. Potatoes (high in potassium, magnesium and fiber), bananas (high in potassium), beans and cowpeas (nutritious chock-full of magnesium, soluble fiber and potassium) garlic, fish, cashew, almonds, fruits (papaya, mango, avocado, watermelon etc.) and vegetable amongst others seem to be cheap and affordable for low-income individuals. A great factor in adherence to DASH diet is making wise food choices as sodium salt is higher in processed foods with lower amounts of sodium being found in naturally occurring foods [24]. Hence, it is advised that money be spent on the recommended food, no matter how small, than the easy to fix processed food of the same Naira worth. This can be greatly achieved once the danger and benefits of these food items are explained during counseling by the physician or dietician.

Conclusion

Oyedunni et al proposed the availability of two patient's report record. One with the physician and one with the patient. It was also advised that constrain column be added to each PRC to record cause of low adherence to the DASH diet. This review recommends that a DASH daily time table be attached to each PRC so there would be a goal to work towards. Also, prescriptions should be translated to simple cultural language that the patient and caregivers can understand. Track record of improvement or regression and other genetic factors should also be recorded, as record keeping helps to notice substantial changes in medication and it helps the patient not to start afresh if seen by another attending physician.

Conflict of Interest

The author declares no competing interests.

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***Correspondence to**

Besidonne CE

The Ingenuity Lab

University of Nottingham, Nottingham

United Kingdom

Tel: +447884986926

E-mail: besidonne.charles@gmail.com