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Development of Guidelines for Management of Hypertension in Rural Areas in Delta State, Nigeria

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ABSTRACT

Hypertension (high blood pressure) is presently one of the most important risk factors for the development of cardiovascular diseases. Several developed and developing nations including Nigeria have adopted various initiatives to prevent and/or manage hypertension. This article entails the development of guidelinesby means of integrated and collaborative approach involving experts knowledgeable in the field coupled with community actionin rural settings in Delta State Nigeria. Using the Nominal Group Technique meeting, a group of seven key stakeholders knowledgeable in the field were brought together to harmonize their ideas and experiences within a period of three days. The meeting lasted six hours each day.Each round addressing a topic lasted for an hour and 45 minutes.Major concepts addressed were: optimal diagnosis and appropriate medical evaluation for high blood pressure, principles of blood pressure measurement and different steps in blood pressure measurement. Others are management options (routine baseline investigations, pharmacological and non-pharmacological measures) and prevention of high blood pressure as well as community screening programmes. This simple guideline will not only serve as a *vade mecum* but will also have a strong impact on the health, quality of life and mortality rate among rural communities in Nigeria.

Keywords: Hypertension, Management, Guidelines, Rural community, Nigeria, Nominal Group Technique.

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INTRODUCTION

This work entails the development of guidelines on screening programmes, standard of assessment, management and review of patients with high blood pressure, using an integrated approach through a "System Support Strategy", combining appropriate and effective clinical care with community action. This took into account the facilities, the social and environmental factors and other issues that influence the development of high blood pressure in rural settings in Delta State Nigeria. The developed guidelines included the following indicators: promoting appropriate care, reducing inappropriate or harmful care, reducing variations in delivery of care, improving access to care, improving the knowledge base across disciplines, educating and empowering clinicians and patients, facilitating coordination and continuity of care and facilitating ethical care[1]. Hypertension is a global health challenge affecting a high proportion of adults. Nigeria is one of the countries in sub-Saharan Africa known to have structured programmes for hypertension by way of issuing guidelines for the prevention, control and management of the condition[2]. The guidelinesoutlined here arethe first set of guidelines developed for use by community members, non-trained health workers (such as Community Health Officers and Community Health Extension Workers) and students during clinical exposure in specific rural settings in Delta State, Nigeria.Hypertension, also known as high blood pressure, simply means the sustained elevation of blood pressure of an individual above the normal level for the age, gender and race of the individual. High blood pressure is often called a 'silent killer' because it may not present with symptoms until complications set in. In Nigeria, its prevalence is on the increase, which is likely attributable to the adoption of Western lifestyles. There are usually urban/rural and male/female dichotomies. The prevalence in rural areas was reported to be 13.5%–46.4% in both genders, 14.7%–49.5% in men and 14.3%–68.8% in women[3]. In Abia, an Ibo community in Nigeria, the prevalence of hypertension was also high in both rural and urban settings[4]. In a recently concluded epidemiological survey conducted by the researcher in a rural community in Delta State, Nigeria (yet to be published), the prevalence of hypertension was 44%. Based on this epidemiological survey and another qualitative study on the cultural practices used for hypertension management in the same community, the community made a request for simple guidelines to help them identify and manage hypertension in the community. This led to the researcher conducting a Nominal Group Technique meeting with a group of experts knowledgeable in the field to develop these simple guidelines for use by the community members, non-trained health workers (Community Health Officers and Community Health Extension Workers)and students during clinical exposure in the rural setting. This pointed to the need to develop and promote

evidence-based, accessible and comprehensive guidelines for the management of hypertension at rural settings by trained and non-trained health care professionals in Nigeria.

MATERIALS AND METHOD

The objective of this guideline is to develop a simple, comprehensive and practical format or approach for diagnosing, managing and reviewing of patients with hypertension in the rural, resource-limited communities of Delta State, Nigeria. This was achieved by means of integrated and collaborative approach involving experts knowledgeable in the field coupled with community action. A group of key stakeholders were brought together to harmonize their ideas and experiences. The data from the quantitative and qualitative studies conducted in this same rural community were used in the development of the guidelines in the course of tackling the topics and questions addressed during the meeting.Nominal Group Technique (NGT) is a structured variation of small-group discussion aimed at reaching consensus. The NGT meeting included the following key stakeholders and participants: the researcher/moderator (an academic and health care professional), four other academics from the College of Health Sciences, Delta State University, Abraka, Nigeria who are also health care professionals (including one academic who is also a medical practitioner in primary health care and family medicine)and a senior nursing officer for primary health care services who is also a local government health staff member and a representative of the study community. The stakeholders were purposively selected from lecturers in the College of Health Sciences who were also health care professionals, the researcher included.The NGTmeeting was originally stipulated for five days, later reduced tothree days because some of the key stakeholders had other important commitments after the third day. An invitation for the NGT meeting was forwarded to the key stakeholders three weeks prior to the scheduled date to obtain their consent and facilitate their preparation. The first day took the form of a session lasting for about seven hours to accommodate the introduction and explanation time, with intervals for tea break and lunch. Each round addressing a topic lasted for an hour and 45 minutes. Topics 1, 2, 3 and 4 were addressed on the first day, topics 5 and 6 on the second day and topics 7, 8 and 9 on the third and last day (Table 1).The current effort (development of this guideline) identified and explained the aspects, procedures and activities which are feasible in rural settings,taking account of the availablefacilities and resources (human and material). Emphasis was also placed on diet as a lifestyle modification, with indication of some recommended diets. Other unfeasible aspects were also identifiedwith recommendations for referrals or modification to suit the rural setting, thereby making the guidelines specific to rural communities in Delta State Nigeria.

Table 1: Summary table of all topics in the guideline

1. Introduction
2. Objectives and Methodology
3. Diagnosis of High Blood Pressure
4. Optimal diagnosis of high blood pressure
5. Appropriate medical evaluation for high blood pressure: 5.1 History Taking 5.2 Physical examination 5.3 Investigation
6. Blood Pressure Measurement 6.1 Principles for blood pressure measurement 6.2 Different steps in blood pressure measurement: 6.2.1 Explanation 6.2.2 Posture of patient and position of arm 6.2.3 Position of manometer 6.2.4 Inflation of the cuff and reading of systolic and diastolic blood pressure
7. Management Options for High Blood Pressure 7.1 Routine baseline investigation(s) in the management of high blood pressure 7.2 Non-pharmacological measures for high blood pressure control 7.2.1 Life style modification (using the HEDWAS mnemonic) and Control of stress 7.2.2 Pharmacological measures for high blood pressure treatment
8. Prevention of High Blood Pressure and Review of Patients 8.1 Preventive measures for high blood pressure vis-a-vis, primary (including screeningprogrammes), secondary and tertiary measures. 8.2 Review of Patients
9. Conclusion

Stages and duration of the guideline development

The researcher/moderator followed the stages listed below in the NGT meeting.

1. *Introduction and explanation:* The moderator welcomed the participants (the six persons listed above) and explained to them the purpose and procedure of the meeting.
2. *Silent generation of ideas:* The moderator provided each participant with a sheet listing the questions to be addressed and asked them to write down all ideas that came to mind when considering the questions. During this stage the moderator asked participants not to consult or discuss their ideas with others. Time allocated for this stage was approximately 10 minutes.
3. *Sharing ideas:* The moderator invited participants to share the ideas they had generated. She recorded each idea on a flip chart using the words spoken by the participant. The round-robin process continued until all ideas were presented. There was no debate about items at this stage and participants were encouraged to write down any new ideas that arose from what others shared. This process ensured that all participants got an opportunity to make an equal contribution, and provided a written record of all ideas generated by the group. Time allocated for this stage was 30 minutes.

4. *Group discussion:* Participants were invited to seek verbal explanation or further details about any of the ideas that colleagues had produced that were not clear to them. The moderator's task was to ensure that each person contributed and that discussion of all ideas was thorough without spending too long on a single idea. The researcher ensured that the process was as neutral as possible, avoiding judgment and criticism. The group suggested new items for discussion and combined items into categories but no ideas were eliminated. Time allocated for this stage was 45 minutes.
5. *Voting and ranking:* This involved prioritizing the recorded ideas in relation to the original questions. Following the voting and ranking process, immediate results in response to the questions were available to participants so that the meeting concluded having reached specific outcomes. Time allocated for this stage was 20 minutes.

Strength of the current guidelines

The current initiative (development of these guidelines) identified and explained the aspects, procedures and activities which are feasible in rural settings, taking account of the available facilities and resources (human and material). These procedures and/or activities were either modified to suit the setting or recommended for referral. Procedures and activities which were not feasible included blood pressure measurement and assessment, physical examination (examination of the cardiovascular system for heart size, enlarged heart, optic fundi and the nervous system for evidence of hypertensive retinopathy) and routine baseline investigations (serum urea, creatineand electrolytes for assessment of kidney function, lipid profile for assessment of cholesterol levels, echocardiogram and chest X-Ray for assessment of heart enlargement). Others were pharmacological and non-pharmacological (lifestyle modification) measures for high blood pressure control. All these have been captured further in relation to each procedure and activity, thereby making the guidelines specific to rural communities in Delta State Nigeria.

RESULTS AND DISCUSSION

Diagnosis of high blood pressure

This will be discussed in relation to optimal diagnosis of high blood pressure and appropriate medical evaluation for high blood pressure.

Optimal diagnosis of high blood pressure

An adult individual with blood pressure of ≥120/80 mmHg on three different occasions, with at least 30 minutes interval, is considered to be hypertensive (Nigerian Hypertension Society, 2005). An isolated systolic elevation of ≥150mmHg or diastolic of ≥100mmHg may need only a single reading to make a diagnosis[5].

Blood Pressure Measurement

Blood pressure measurement will be addressed by first highlighting the basic principles for this measurement, followed by discussion of the different steps in blood pressure measurement: explanation, posture of patient and position of arm, position of manometer and inflation of the cuff, and reading of systolic and diastolic blood pressure. This could involve anelementof skill, especially for nurses who are the most readily available health care providers at rural settings[6]. These details have also been substantiated byvarious West African College of Physicians update courses on hypertension[5].

Principles for blood pressure measurement

These recommendations apply to all validated devices both in clinic and in self-blood pressure monitoring (SBPM).

Blood pressure is measured using the appropriate cuff size.

The patient should not have smoked or taken food or coffee for 30minutes before blood pressure measurement.

The patient should be comfortable, with no pains or full bladder.

Blood pressure should be rechecked in 2 weeks if mild, moderate and in target organ damage.

The blood pressure measurement device and its attachments (tubing, cuff, and valve) must be serviced and calibrated at least once each year.

- Management Options for High Blood Pressure
- Routine baseline investigation(s) in the management of high blood pressure

Urinalysis: Check for frothy urine (mass of small bubbles)

Perform urine dipstick analysis for protein

Perform urine dipstick analysis for blood

Perform urine dipstick analysis for glucose.

Note: Based on the researcher's assessment of the health care facilities available in the rural community, other important routine baseline investigations like serum urea, creatineand electrolytes (for assessment of kidney function), lipid profile (for assessment of cholesterol levels), echocardiogram and chest X-Ray (for assessment of heart enlargement) may not be feasible at the rural settings where high-technology facilities or equipment are not available. Patients who may need these investigations should be referred to a higher level of health care.

Non-pharmacological measures for high blood pressure control (life style modification and elimination of stressors/predisposing factors)**.**

Life style modification (using the HEDWASmnemonic) **and control of stress.**

Health education:

Hypertensive patients need to be educated on the status and progress of their condition. The idea of health education is to empower individuals to participate actively and ensure the

quality of the management of their hypertension. Effective, honest and open two-way communication between the health care provider and the patient is critical to the prevention and management of chronic life-long conditions like hypertension. Acquisition of communication and counselling skills by health care professionals is essential, preferably in the language of the study population (Igbo language).

Education on traditional and cultural practices:

Thequalitative study identified some traditional and cultural practices used for hypertension management in the community in particular, traditional palm kernel soup (which is very high in cholesterol), use of alcohol as part of a traditional medicinal practice, and spiritual practices. It is recommended that training for health workers should give attention to such factors, particularly in relation to dietary advice, although some of these practices such as the spiritual practices may be difficult to address during health education because of their sensitive nature. Some traditional practices like the use of medicinal/herbal plants may not be suitable to discuss with the patients as there are no documented studies on their use and effect in the rural community.

Exercise

Regular exercise/physical activity is essentialand helps to prevent and control high blood pressure, lose weight or maintain ideal weight, manage diabetes by reducing insulin resistance, manage stress, improve lipid profile, decrease blood clotting, increase fibrinolytic activity, help in smoking cessation, improve blood cholesterol levels and increase energy to carry out daily activities. Exercise should be regular (moderate exercise for at least 30 minutes per day, on most days of the week, is recommended) and aerobic (activities such as cycling or brisk walking) depending on the ability and strength of the patient. According to Nurses Hypertension Association Guideline, 2004, contra-indications to exercise are: unstable angina, resting blood pressure BP >180/110mmHg, symptomatic orthostatic BP drop of >20mmHg, certain heart conditions, resting tachycardia >120bpm, acute illness, uncontrolled diabetes and recent embolism or surgical procedure.

Note: Any patient who has a history of coronary heart disease (CHD) should be considered for an exercise tolerance test prior to taking up increased physical activity programmes.

Diet:

Dietary Approach to Stop Hypertension (DASH diet) is recommended**.** Thisis chiefly diets low in fat, sugar and rich in fruits and vegetables.(U.S. Department of Health and Human Services, et al., 2004)[9]**.**If your blood potassium is too low, blood pressure may increase. Including potassium- rich foods in your diet may help in managing high blood pressure. High-potassium foodsinclude bananas, dried fruits, skim milk and potatoes. If you take a

diuretic ("water pill") to control your blood pressure, it is important tohave your care provider check your blood potassium level during your regular check-ups. You may need to take a potassium supplement to keep your blood potassium within the normal range. Including potassium-rich foods (e.g., banana and plantain) in your diet is also necessary.Emphasis has to be placed on diet as a lifestyle modification in this rural setting. The most common local diet in most rural settings in Delta State is ofeakwụ(palm kernel soup), which is a high cholesterol foodstuff. This is taken with eba (pounded yam), fufu (boiled yam), potatoes, boiled plantain or rice. We recommend an alternative soup prepared with more vegetables which can be taken with any of the above mentioned foods; these vegetables (commonly and readily available in the community) are spinach (popularly known as "green"), ụgụ, onugbu, ọha and ụtazịzị. Another common dietary item is boiled yam with palm oil mixed with salt. We recommend that boiled yam be taken with vegetable soup or stew if desired. Low-salt diets will be discussed in detail in relation to salt reduction as a lifestyle modification. The diets and overall management of hypertensive patients with co-morbid conditions need to be carefully planned, depending on the type of co-morbid condition. Table 3 below shows a list of appropriate diets for hypertensive patients with co-morbid conditions.

Table 2: Blood pressure measurement and assessment

	Steps in blood pressure measurement and assessment
1.	**PREPARATION OF THE PATIENT**
A.	**Explanation:**
i.	Briefly explain the procedure to the patient.
ii.	Explain that cuff will get tighter around the arms.
iii.	Explain need for more than a reading.
B.	**Posture of patient and position of arm:**
i.	Patient to relax for at least 5 minutes before measuring BP.
ii.	Let patient sit with back supported and feet on the floor.
iii.	Measure BP in standing position for the elderly.
iv.	Position arm horizontally and supported with the antecubital fossa at heart level.
v.	Remove tight or restrictive clothing from the arm.
vi.	Use an appropriate BP cuff size for the patient.
vii.	Use a large bladder for fat arms.
viii.	Place cuff bladder 80% around arm with centre over brachial artery.
ix.	Place cuff with the tubing pointing to the shoulder.
x.	Place lower edge of the bladder 2 – 3cm above the point of maximal pulsation of the brachial artery.
C.	**Position of manometer:**
i.	Position manometer vertically.
ii.	Position manometer not more than 1m from observer.
iii.	Position manometer at eye level of observer.
D.	**Inflation of the cuff and reading of systolic and diastolic blood pressure:**

i.	Palpate the radial or brachial pulse of the subject.
ii.	Rapidly inflates cuff to 30mmHg above where the pulsation disappears.
iii.	Place stethoscope over brachial artery with no pressure.
iv.	Deflate cuff gradually at a rate of 2 – 3mmHg per second.
2.	**HISTORY TAKING**
a.	Family history of hypertension and other diseases.
b.	Duration and previous levels of high blood pressure.
c.	History of drugs used.
d.	Any other associated illness/disease.
e.	Secondary causes of hypertension.
f.	Lifestyle factors
g.	Personal, psychosocial and environmental factors
h.	History of diabetes
3.	**PHYSICAL EXAMINATION**
a.	Note signs and symptoms of oedema (swollen legs) and previous strokes
b.	Measure height.
c.	Measure body weight.
d.	Determine body mass index (BMI).
e.	Examine the apex beat and shift of apex beat (normal is at 5th intercostals space mid clavicular line)
f.	Examine the lungs for wheezes and crackles.
g.	Examine the abdomen for bruits and other masses
h.	Measure blood pressure and check pulse (arterial wall palpation)
i.	Check for hyperactive precordium
4.	**INVESTIGATION**
a.	Perform urine dipstick analysis for protein and check for frothy urine.
b.	Perform urine dipstick analysis for blood.
c.	Perform urine dipstick analysis for glucose.

Note: Based on the researcher's assessment of the health care facilities available in the rural community, examination of the cardiovascular system for heart size, enlarged heart, optic fundi and the nervous system for evidence of hypertensive retinopathy which are still important aspects of physical examination should be done by specialists which may not be available at the rural settings. The patient needs to be referred to a higher level of health care.

Table 3: Appropriate diets for hypertensive patients with co-morbid conditions

Cardiac conditions	**Renal conditions**	**Hormonal conditions(e.g.diabetes)**
Low salt diet ▫ Low fat/cholesterol diet (non-fried foods) Vegetables (onugbu, ụgụ and ọha)	▫ Low salt diet ▫ Low potassium diet (indomine noodles, water melon, rice and cooked vegetable) ▫ Low protein diet (parboiled rice, yam flour, *gari*/*eba*) ▫ Low phosphorus diet (spinach, mustard leaves, lettuce, boiled yam, apple, lime and lemon) Moderate calorie diet (pounded yam, cassava flour/*fufu*)	▫ Low salt diet ▫ Low sugar (boiled unripe plantain) ▫ High roughage diet (*onugbu*, *ụgụ*, *ọha*) ▫ Low calorie diet (*amala*)

Note: Local foods have been referred to for relevance. Some medical conditions such as kidney disease may require reduced potassium in the diet, in which case the patient needs to be referred to a registered dietician who can give more information about foods rich in potassium.

Weight control and maintenance:

Being overweight is very closely connected to high blood pressure, especially if your body mass index (weight in kilograms divided by your height in meters squared) is 25 or greater. Excess body fat (for example a waist measurement of 35 inches or greater in women or 40 inches or greater in men) is also related to high blood pressure, diabetes, increased blood lipid levels, and coronary heart disease.

Some recommended weight loss tips

Choose foods low in saturated fat, cholesterol, trans fat (partially hydrogenated fats) and refined sugar.

Eat at least five servings of fruits and vegetables each day. One serving is equivalent to one orange or apple or mango or banana, or three tablespoons of cooked vegetables (e.g.,*ụgụ*, *onugbu*, *ọha*, *ụtaziịị*). Try to avoid juice and canned fruit, which are generally high in sugar and may add more calories. Watch your food portion sizes. One quarter of your plate should comprise a palm-size portion of lean protein such as chicken breast, another quarter should comprise a fist-size portion of unrefined grain such as brown rice, and one-half of your plate should be filled with a variety of vegetables. Do not skip meals. Eating three meals a day plus snacks is essential in weight management. Remember to snack on fresh fruit. Make sure you take enough fibre; about 25 to 30 grams of fibre are recommended each day. To help you boost your fibre intake, choose whole-grain, high-fibre breads and cereals. Choose whole-wheat rice instead of white rice and include more dried beans (like soya) in your meals. Fibre helps fill you up faster, which can help you to curb hunger and eat less. Most importantly, soluble fibre can help lower your cholesterol. Exercise daily. Participate in physical activity daily as recommended by your physician or exercise physiologist. Eat the majority of your calories in the first half of your day. Enjoy portion-controlled snacks during the day to control hunger at night. Drink plenty of water. Take at least 6 to 8 glasses of fluid each day. Water helps keep you adequately hydrated and often helps prevent overeating.

Set realistic goals. Weight loss should be gradual.

Note: Patients may also be referred to registered dieticians who can help them evaluate their current eating habits and plan strategies to help them lose weight.

Alcohol reduction:

Drinking too much alcohol can increase your blood pressure and make it more difficult to treat high blood pressure. If you have high blood pressure, it is recommended that you cut

down if you drink excessively. The recommended alcohol intake for men is 20–30g/day (2 drinks) and 10–20g (1 drink) for women.

Salt reduction:

Reducing the amount of sodium (salt) in the diet can help lower blood pressure especially for hypertensive patients. Sodium is found in table salt and some of the foods we eat, most commonly, preserved and canned foods. Salt intake of <100mmol/day is highly recommended (Josephs, 2009)[7]. In rural settings in Delta State, salt reduction strategy can be achieved by using some of the commonly eaten local foods. We recommend the following: boiled yam should be prepared with salt to taste; sprinkle some salt on the fish for preservation; use more herbs and spices instead of salt to flavour foods and be careful of the use of *ogilisi* which serves as soup flavour and is also salty; avoid processed foods (canned foods, cheeses and canned meats); foods preserved by salting and smoking should be avoided. Fresh types of these can be taken.

Note: Patients may also be referred to registered dieticians who can help them evaluate their current food choices and help them select foods lower in sodium.

Smoking cessation:

If you smoke, please "Quit"**.** Smoking and tobacco use are significant risk factors for a variety of chronic disorders including heart and blood vessel disease.

Tips on how to stop smoking:

Make a list of all the reasons you want to quit smoking. Read over the list every day, before and after you quit.

Make a list of activities you can do instead of smoking.

Stop smoking in certain situations before actually quitting.

Pick a date for quitting and stick to it.

Get a friend whois doing the same to help you quit, and ask your family and friends for support.

Control of stress and anger

It is known that sudden stress can cause an acute rise in blood pressure; one example of this is the marked increase in systolic blood pressure that can be caused by the act of taking blood pressure. Chronic stress is suspected to be one of the risk factors for hypertension. During periods of stress or anger, blood pressure rises. If the stress and anger persists over time, high blood pressure can occur. However, the role of chronic stress has been difficult to assess, partly because stress means different things to different people and because stress has not always been easy to measure. Stress and anger are also related to heart disease.

Tips to control stress and anger

Manage your time.

Set realistic goals for what you can accomplish each day within your strength and capability.

Take time each day to relax.

Learn relaxation techniques. Relaxation therapies can reduce blood pressure and people may wish to try them. Always try to avoid the scene of anger. This may serve as a way of removing the stressors/stress agents.

Pharmacological measures for high blood pressure treatment

This is a very delicate aspect of management and caution should therefore be taken in relation to the type of drugs prescribed (their class) and the side effects. These drugs are best obtained from health centres, registered patent medicine vendors and pharmaceutical shops within the community. Anti-hypertensive drugs are best given based on the different classes, individual peculiarities and type commonlyavailablein the locality. Considerations for drug therapy include efficacy, individualizing therapy, age, race and "patient-friendly" regimens (Olaniyan, 2008)[8].The basic first-line drugs for the treatment of high blood pressure are:

1. Diuretics: There are three types: loop diuretics, thiazide-based agents and K-sparing diuretics. The thiazide-based diuretics are mainly prescribed as first-line drugs.
2. Calcium channel blockers (e.g.,Nifedipine and Amlodipine).
3. Angiotensin converting enzyme inhibitors.

Other anti-hypertensive drugs include: beta blockers, central acting drugs (e.gAldomet), vasodilators, angiotensin II receptors blockers (ARB), anxiolytics (diazepam and Lexotan), antithrombotics - ASA (Vasoprin and heparin).

In this rural setting, the most available, affordable and accessible drugs are the **diuretics, calcium channel blockers** and the **central acting drugs**. Diuretics and calcium channel blockers are mostly prescribed because of their efficacy among the blacks– especially diuretics and "patient-friendly" regimens. According to the key informants in the qualitative study which led to the developed guidelines, sharing of medicines with family members is part of their lifestyle as they believe the medicines perform the same function as long as the symptoms are similar, irrespective of the individual diagnosis. Education on the risk of sharing medicines is pertinent and should be included in the training of health workers.

Note: If blood pressure is 20/10mmHg higher than the required level, two different classes of anti-hypertensive drugs have to be used. Also, individuals who have diabetes or any kidney disease MUST be placed on angiotensin converting enzyme (ACE) inhibitors because these arerenoprotective. Complicated hypertension/in association with co-morbidities should be referred early enough to specialist physicians.

Prevention of high blood pressure and review of patients

Different preventive measures for high blood pressure vis-a-vis, primary (including screening programmes), secondary and tertiary measures

Primary measures:

These include regular blood pressure check, lifestyle modification and intake of supplements such as calcium, potassium (k+) and magnesium (Mg+) .Lifestyle modification has been addressed in detail above (see HEDWAS). It is important that every adult male/female in the community should have a regular blood pressure check, which can be done during the periodic medical examination. Individuals who do not have high risk factors (the aged, family history of hypertension, obsessive, etc.) should have their blood pressure checked at least once every 2 years, while those at high risk should have their blood pressure check at least once every year.

Screening programmes:

Thereare three types of screening programme: mass screening, targeted screening and opportunistic screening. Amassscreeningprogramme is when a health care provider enters into a community setting and screens (in blood pressure assessment) any adult male or female in the community. Atargetedscreeningprogramme is focused on a particular category of individuals according to a particular criterion – for example those having high risk factors (like the aged or obsessed). An example of an*opportunistic screening programme*would be where a health care provider visits a friend in the community and individuals in the vicinity seize the opportunity to ask for a blood pressure check.

Secondary measures:

The secondary measures for prevention of high blood pressure include prevention of complications**,** prompt andadequate treatment of high blood pressure, routine investigations, encouraging compliance, preventingcirculation of fake drugs and educating the patients on side effects of the drugs.

Tertiary measures:

Theseinclude reducing the development of complications and managing the progression of complications to prolong life.

Review of patients

In the course of screening programmes for blood pressure there may be individuals who have other diseases of interest or concern; such individuals will need further assessment or review. Review of patients is also accomplished when investigations (e.g., urinalysis, blood sugar) are done to confirm whether an individual is hypertensive. Individuals who are confirmed hypertensive may need further investigations (e.g., chest x-raysor echocardiograms)which

involve high-technology equipment to monitor and prevent complications. In this case, referral process is necessary when the high-technology equipment is not available at the rural setting (Aderamo & Magaji, 2010)[10].

CONCLUSION

The practice guidelines developed in this study stipulated a simple format for standard of assessment, screening programmes, management and review of patients with high blood pressure in a typical rural community in Delta State, Nigeria. Facilities available in the setting as well as the social and environmental factors influencing the development of hypertension in rural settings were considered. The blood pressure measurement procedures and the pharmacological measures for treatment of high blood pressure need to be updated from time to time as new skills in practice emerge. Non-pharmacological measures for high blood pressure control (such as the HEDWAS regime) would have a strong impact on the health, quality of life and mortality rate among rural communities in Nigeria. Community screening activities are important for population subgroups, especially those at high risk of developing cardiovascular disease and with limited access to medical care. The guidelines provide balanced information to steer clinicians, academics, students and community members, rather than strict rules that would constrain their judgment about the management of individual patients each with their own personal, social, ethnic and cultural characteristics.

Strategic implications for implementing these guidelines

The implementation of these guidelines is an active process that will involve dissemination, community awareness and education. It will require the full collaboration and co-operation of policy makers and administrators at the local government level as well as funders. The nurses, local professional groups (community health officers and community health extension workers) and the community representatives will need to meet to discuss how to implement the guidelines in the community. Oneobstaclelikely to be encountered will be funding. Support materials that will be needed for implementation include organising conferences and workshops and screening programmes.

Research needs

We recommend further research on special considerations for hypertension in certain populations, which would include hypertension in pregnancy, the elderly, adolescents, persons living with HIV/AIDS and people with co-morbid conditions.

Outcomes: Extensive data from population based studies in rural settings have shown the benefit of hypertension management. The target blood pressure (BP) for antihypertensive management is systolic <140 mmHg and diastolic <90 mmHg (Adebayo, et al., 2013) with minimal or no drug side effects.

Benefits: Benefits of management include reduced complications like stroke, cardiac failure and other heart diseases.

Recommendations: The correct blood pressure measurement procedure is described and recommendations for antihypertensive therapy are stipulated. Lifestyle modification in line with the HEDWAS regime (Health education, Exercise, Diet, Weight control and maintenance, Alcohol reduction, Salt reduction, Smoking cessation) are necessary in the management of every patient. Major criteria and considerations for drug therapy are listed. First line drugs for the treatment of high blood pressure include diuretics, calcium channel blockers (e.g.,nifedipine and amlodipine) and angiotensin converting enzyme inhibitors. The diuretics are of three types, the loop, thiazide- based agents and the K- sparing. The thiazide based type of diuretics are mainly prescribed as first line drugs.

Validity: The guideline was developed by academics in Delta State University Abraka, Nigeria who are also qualified and registered health care professionals in Nigeria and a representative of the study community.

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