

Approach to hypertension among primary care physicians in the West Region of Cameroon: substantial room for improvement

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Objective: This study was conducted to assess the knowledge and approach of primary care physician (PCP) towards the management of hypertension in Cameroon.

Methods: In 2012 we surveyed 77 PCPs among the 111 working in the West region of Cameroon. We used a standardized questionnaire assessing practices regarding the detection, evaluation and treatment of hypertension, and source of information about updates on hypertension.

Results: Participants had a mean duration of practice of 10.1 (SD 7.6) years, and received an average of 10.5 (SD 5.8) patients daily. Most of the PCPs (80.5%, n=62) measured blood pressure (BP) for all adult patients in consultation, however, only 63.6% (n=49) used correct BP thresholds to diagnose hypertension. Sixty-seven PCPs (87.0%) ordered a minimal work-up for each newly diagnosed hypertensive patient, but only the work-up offered by 8 (10.4%) PCPs was adequate. Regarding treatment, the most commonly prescribed medications as monotherapy were loop diuretics (49.3%). Bitherapy mostly included the combination of a diuretic with other drug classes. Most of PCPs used incorrect target BP, with a general tendency of using higher target levels. PCPs received updates on hypertension management mostly through drug companies representatives (53.2%, n=41). Up to 97.4% were willing to receive continuing medical training on hypertension.

ConclusionS: PCPs' knowledge and management of hypertension is poor in this region of Cameroon. Our data point to a need for continually updating the teaching curricula of medical schools with regard to the management of hypertension, and physicians in the field should receive continuing medical education.

Keywords: Hypertension; primary care physicians (PCPs); diagnosis; management; Cameroon; Africa

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Introduction

Hypertension is the leading cause of cardiovascular disease (CVD) and deaths globally (1). It is associated with at least 7.6 million deaths per year worldwide (13.5% of all deaths). Eighty percent of global CVD mortality occurs in low- and middle-income countries (LMIC) (1-3). The importance of blood pressure (BP) as a modifiable risk factor for CVD is well-recognized and many effective and inexpensive BP—lowering treatments are available. There is considerable evidence that long-term BP lowering to what is considered

either normal or optimal levels reduces the likelihood of CVD and results in several other important health benefits (4).

The common rule of halves in hypertension epidemiology suggests that about half of hypertensive populations are diagnosed, half of those diagnosed are treated, and half of those treated are controlled; these estimates may be optimistic in many LMIC. Indeed, poor BP control has been found in these countries (5-7). In Cameroon for instance, a survey conducted in 2011 found a hypertension prevalence of 47.5%, with only 31.7% of all individuals with

hypertension who were aware of their status. Moreover, 59.9% of those aware (19% of all those with hypertension) were on treatment, among whom only 24.6% (4.7% of all those with hypertension) achieved expected target BP levels (8). Other studies have confirmed this high prevalence of hypertension and poor BP control in Cameroon as well as in other African countries (9-11), with consequentially complications of hypertension, especially stroke and heart failure, which are becoming rapidly more frequent in the region (10-13).

Physicians' inability to provide good management of hypertension has been identified as an important contributor to poor BP control in hypertensive patients (14-17). In Cameroon where most of hypertensive patients remain uncontrolled, no previous study has investigated primary care doctors' state of knowledge and practice patterns on the management of hypertension. This study was carried out to assess the approach of primary care physicians (PCPs) to the detection, evaluation and treatment of hypertension in Cameroon. It is believed that data will contribute to strategies to improve BP control among hypertensive patients in Cameroon.

Methods

Ethics statement

The study was approved by the Regional Office of the Ministry of Public Health (MOH) for the West region, acting as Ethics Committee. All participants interviewed in the study provided a written informed consent.

Study population and setting

We carried out this survey in February 2012 in the West region of Cameroon which had in 2010 a population of 1,785,285 inhabitants (18). The region is divided into 20 health districts, and has a total of 530 health facilities, both public and private, but none is a teaching hospital. There were 111 PCPs (general practitioners) working in the region at the time of the survey. Among these 111 PCPs, we included those who were present at their work place during working hours when the investigator visited, and who consented to participate in the study.

Data collection

Data were collected by a trained investigator using a

structured pretested questionnaire administered during interviews of about 10 minutes. The questionnaire was developed based on previous studies (16,19), and assessed: (I) background characteristics such as sex, age, number of years of practice, location of practice, daily patients' load; (II) detection of hypertension including number of BP readings, threshold levels of BP; (III) evaluation of patients with high BP especially with paraclinical tests to determine co-morbidities, target organ damages and cardiovascular diseases; (IV) treatment of hypertension including patient education, advise on non-pharmacological measures to control BP, choice of antihypertensive drugs and the therapeutic target of BP; (V) source of information on hypertension care and willingness to receive additional training on hypertension.

Participants' approach to hypertension was evaluated in accordance with the recommendations of the Seventh report of the Joint National Committee (JNC 7) on prevention, detection, evaluation, and treatment of high BP (20).

Data analysis

Data were coded, entered and analyzed using the Statistical Package for Social Science (SPSS) version 20.0 for Windows (SPSS, Chicago, Illinois, USA). We described continuous variables using means with standard deviations (SD), and categorical variables using their frequencies and percentages. We divided our study population in recent graduates (≤ 10 years since graduation) and older graduates (> 10 years since graduation) and made comparison between them. The Chi-square test or its equivalents were used to compare qualitative variables and a P value less than 0.05 was considered statistically significant.

Results

Among the 111 PCPs working in the region at the time of the study, 77 were met during the study period and asked to participate in the study, and all of them consented. Participants were mostly males (71.4%), with a mean age of 38.5 (SD 8.8) years and a mean duration of practice of 10.1 (SD 7.6) years. They received an average of 10.5 (SD 5.8) patients daily, and specifically 2.1 (SD 1.6) hypertensive patients.

Detection

Most of the PCPs (80.5%, n=62) measured BP for all adult patients in consultation, however, only 63.6% (n=49)

Table 1 Approach toward hypertension diagnosis and treatment

Variables	All (n=77)	Years since graduation		P value
		≤10 n=36 (46.8%)	>10 n=41 (53.2%)	
Characteristics of participants				
Sex: male	55 (71.4)	19 (52.8)	36 (87.8)	0.0009
Average number of patients seen per day (SD)	10.5 (5.8)	10.4 (4.0)	10.7 (6.9)	0.36
Type of facility: public	42 (54.5)	20 (55.6)	22 (53.7)	1.00
Area of practice: urban	56 (72.7)	28 (77.8)	28 (68.3)	0.44
Received continuing medical training on hypertension	33 (42.9)	11 (30.6)	22 (53.7)	0.06
Detection of hypertension				
Measure BP for all adult patients in consultation	62 (80.5)	28 (77.8)	34 (82.9)	0.58
Correct number of BP readings before assigning hypertensive status	41 (53.2)	23 (68.9)	18 (43.9)	0.07
Use of correct BP level for labeling a patient with hypertension [†]	49 (63.6)	24 (66.7)	25 (61.0)	0.64
Use of correct criteria for the diagnosis of hypertensive emergencies	13 (16.9)	9 (25.0)	4 (9.8)	0.13
Evaluation of hypertensive patients				
Advise investigations for patients with hypertension	67 (87.0)	32 (88.9)	35 (85.4)	0.74
Adequacy of the minimal work-up [¶]	8 (10.4)	6 (16.7)	2 (4.9)	0.14
Treatment of hypertension				
Recommend lifestyle modifications	40 (77.9)	32 (88.9)	28 (68.3)	0.05
Use of sedatives for treating hypertension	5 (6.5)	1 (2.8)	4 (9.8)	0.36
Correct treatment for hypertensive emergencies	40 (51.9)	22 (61.1)	18 (43.9)	0.17
Aim for correct target BP in patients < 60 years [‡]	46 (59.7)	22 (61.1)	24 (58.5)	1.00
Aim for correct target BP in patients ≥ 60 years [‡]	22 (28.6)	10 (27.8)	12 (29.3)	1.00
Aim for correct target BP in patients with renal disease [§]	18 (23.4)	15 (41.7)	3 (7.3)	<0.0001
Aim for correct target BP in patients with CVD [§]	14 (18.2)	10 (27.8)	4 (9.8)	0.07
Aim for correct target BP in patients with diabetes [§]	22 (28.6)	15 (41.7)	7 (17.1)	0.001
Correct attitude once BP normalizes	50 (64.9)	27 (75.0)	23 (56.1)	0.10
Source of information about updates on hypertension management				
Conference	25 (32.5)	9 (25.0)	16 (39.0)	0.23
Colleagues	15 (19.5)	10 (27.8)	5 (12.2)	0.15
Pharmaceutical representatives	41 (53.2)	18 (50.0)	23 (56.1)	0.65
Medical journals or internet	25 (32.5)	13 (36.1)	12 (29.3)	0.63
Willing to participate in education sessions on hypertension	75 (97.4)	36 (100.0)	39 (95.1)	0.50

Values are given as frequencies (%) for categorical variables, and as mean (standard deviation) for continuous variables. [†], Correct threshold for diagnosis of hypertension was defined as systolic BP of ≥140 or diastolic BP of ≥90 mmHg; [¶], minimum work-up includes hemoglobin level and hematocrit, fasting plasma glucose, serum creatinine and blood urea nitrogen, serum potassium and calcium, lipoprotein profile, urinalysis and electrocardiogram; [‡], correct target level of BP was defined as systolic/diastolic BPs <140/90 mmHg; [§], correct target level of BP was defined as systolic/diastolic BPs of <130/80 mmHg in patients with diabetes, kidney disease or CVD; CVD, cardiovascular disease; SD, standard deviation; BP, blood pressure.

of them used correct BP level for labeling a patient with hypertension, and 16.9% (n=13) used correct criteria for the diagnosis of hypertensive emergencies. About half of

the PCPs used the correct number of required BP readings before assigning the hypertensive status (three readings), with an average of 2.7 (SD 0.6) measurements (*Table 1*).

Table 2 Tests ordered as minimum initial work-up to evaluate a patient with uncomplicated hypertension

Tests	Frequency (%)
Serum creatinine	61 (79.2)
Fasting plasma glucose	61 (79.2)
Blood urea nitrogen	53 (68.8)
Lipoprotein profile	39 (50.7)
Electrocardiogram	33 (42.9)
Serum potassium	28 (36.4)
Hematocrit and hemoglobin level	25 (32.5)
Chest X-ray	20 (26.0)
Serum sodium	19 (24.7)
Urinalysis	18 (23.4)
Serum calcium	13 (16.9)
Serum uric acid	11 (14.3)
Cardiac ultrasound	9 (11.7)
Serum magnesium	8 (10.4)
Fundoscopy	8 (10.4)
Serum chloride	6 (7.8)

Evaluation

Sixty-seven PCPs (87.0%) ordered a minimal work-up for each newly diagnosed hypertensive patient, but only the work-up offered by eight participants was adequate (10.4%). The frequency of prescription of the minimal tests recommended by JNC 7 for the initial evaluation of uncomplicated hypertension was 32.5% for hematocrit and hemoglobin level, 79.2% and 68.8% for serum creatinine and blood urea nitrogen, 79.2% for fasting plasma glucose, 36.4% and 16.9% for serum potassium and calcium, 50.7% for lipoprotein profile (including high-density lipoprotein cholesterol, low-density lipoprotein cholesterol and triglycerides), 23.4% for urinalysis and 43.9% for electrocardiogram (*Table 2*).

Treatment

Recommendation of lifestyle modifications to patients was reported highly done (77.9%) in our study. While assessing prescribing practices, we found that five PCPs (6.5%) reported prescription of sedative drugs as their first-line antihypertensive treatment. The most commonly prescribed medications as monotherapy were loop diuretics (exclusively furosemide, 49.3%), thiazide diuretics (27.3%)

Table 3 Antihypertensive drugs prescriptions

Antihypertensive drugs	Frequency (%)
Drugs for oral monotherapy	
Loop diuretics	38 (49.3)
Thiazide diuretics	21 (27.3)
Calcium channel blockers	18 (23.4)
ACE inhibitors	12 (15.6)
Angiotensin II antagonists	11 (14.3)
Aldosterone receptor blockers	3 (3.9)
Beta blockers	2 (2.6)
Central alpha-2 agonists	1 (1.3)
Drugs for oral bitherapy	
Diuretics-ACE inhibitors	26 (33.8)
Diuretics-Calcium channel blockers	19 (24.7)
Diuretics-Beta blockers	10 (13.0)
Diuretics-Central alpha-2 agonists	5 (6.5)
Calcium channel blockers-ACE inhibitors	5 (6.5)
Beta blockers-ACE inhibitors	2 (2.6)
Diuretics-Angiotensin II antagonists	1 (1.3)
Calcium channel blockers-Beta blockers	1 (1.3)
Drugs for hypertensive emergencies	
Injectable nicardipine	40 (51.9)
Sub-lingual nifedipine	22 (28.6)
Injectable furosemide	15 (19.5)
ACE inhibitors, angiotensin converting enzyme inhibitors.	

and calcium channel blockers (23.4%). Bitherapy mostly included the combination of a diuretic and an angiotensin converting enzyme inhibitor (33.8%) or a diuretic and a calcium channel blocker (24.7%). Adequate treatment of hypertensive emergencies with injectable nicardipine was reported by 51.9% of PCPs (*Table 3*). Eight PCPs (10.4%) prescribed only antihypertensive originator brands, 15 (19.5%) only generics and 52 (67.5%) either generics or originator brands.

The correct target BP for patients without relevant cardiovascular comorbidities was aimed for by 44.2% of PCPs (n=34). The correct levels of target BP for patients with CVD, diabetes, and renal disease were aimed for by only 18.2% (n=14), 28.6% (n=22), and 23.4% (n=18) of PCPs, respectively. The general tendency was to use higher target levels. Some of these targets differed significantly among recent versus older medical school graduates (*Table 1*). Once BP control was achieved, 50 (64.9%) PCPs

usually continued with the treatment, 25 (24.7%) reduced the dose and 2 (2.6%) stopped the treatment.

Sources of information

PCPs received updates on hypertension management mostly through drug companies representatives (53.2%, n=41), medical journals or internet (32.5%, n=25) and conferences (32.5%, n=25). Almost all PCPs (97.4%, n=75) were willing to receive continuing medical training on hypertension (Table 1).

Discussion

Hypertension control is a major challenge in LMIC where high BP has reached epidemic proportions becoming one of the leading cause of CVD and deaths (1). Physicians' inability to provide good management of hypertension has been identified as an important contributor to poor BP control in hypertensive patients. In Cameroon, no previous study has investigated primary care doctors' state of knowledge and practice patterns on the management of hypertension. This study was carried out to assess the knowledge and approach of PCPs in Cameroon towards the management of hypertension in accordance to the JNC 7 guidelines.

Studies have shown that hypertension is largely underdiagnosed and poorly controlled in most developing countries (5-11). Systematic screening for hypertension by BP measurement for all adults consulting in a health facility could contribute to improve the poor rates of diagnosis and treatment. Most PCPs (80.5%) in our study reported measuring BP for all adult patients in consultation, hence, an opportunity to diagnose unknown hypertensive patients. However, only 63.6% of them used correct BP thresholds for labeling a patient with hypertension, with a general tendency of using higher thresholds. Moreover, only 16.9% of PCPs used correct criteria for the diagnosis of hypertensive emergencies. Updating PCPs on the correct diagnosis criteria of hypertension would therefore contribute to increased rates of diagnosis and treatment in our setting.

A minimum work-up is recommended for the evaluation of hypertensive patients, along with clinical evaluation, to identify other cardiovascular risk factors or concomitant disorders that may affect prognosis and guide treatment, to reveal identifiable causes of hypertension, and to assess the presence or absence of target organ damage and CVD (20). Although 87% of PCPs in our study reported ordering

investigations to evaluate patients with uncomplicated hypertension, only 10.4% asked an adequate minimum work-up as recommended by JNC 7. This finding is alarming since failure to identify other cardiovascular risk factors, target organ damage and CVD may lead to inadequate treatment and thus poor outcomes (20).

Hypertension treatment include both lifestyle modifications and pharmacologic treatment. Lifestyle modifications reduce BP, prevent or delay the incidence of hypertension, enhance antihypertensive drug efficacy, and decrease cardiovascular risk (20). JNC 7 recommended lifestyle modifications for patients with prehypertension and no compelling indications, and its combination to drug therapy for those with established hypertension. These lifestyle modifications include weight reduction, adoption of the Dietary Approaches to Stop Hypertension (DASH), dietary sodium reduction, physical activity and moderation of alcohol consumption (20). Recommendation of lifestyle modifications to patients was reported highly done (77.9%) by the PCPs in our study. This finding contrasts with that of a study conducted in South Africa where only 50% of doctors indicated that they even mentioned lifestyle modifications to some of their patients (21). Such high awareness of the importance and advice of lifestyle treatments as found in our setting are very important, especially in primary care where preventive interventions are paramount and in low income settings where compliance to drug therapy is usually not optimal due to financial limitations. Indeed, effective lifestyle interventions may reduce the amount and cost of prescribed medications (20).

Although recommendation of lifestyle changes to patients were reported highly done in our study, we did not evaluate the knowledge of these lifestyle changes among our participants. Hence counseling on lifestyle modifications among our participants might be inadequate. Moreover, if the relative light patient load seen in this study might allow time for the physicians to provide counseling on lifestyle treatments to their patients, this could be very difficult in settings where physicians are facing overwhelming heavy patient load (15,21).

A large number of drugs are currently available for reducing BP. Besides thiazide diuretics are the least expensive hypertensive agents (20), there are compelling evidences that they confer the same or even better benefit in preventing the cardiovascular complications of hypertension compared to calcium channel blockers and angiotensin converting enzyme (ACE) inhibitors (20,22). Thiazide diuretics are therefore recommended as preferred initial

agent alone or in combination (20). Unfortunately, thiazide diuretics were underprescribed in our setting, especially in monotherapy. Similarly, a study in the US has shown that despite the various benefits of thiazide diuretics, they remain underutilized (23). For a low income country like Cameroon where access to adequate health care is poor, effective and affordable hypertensive drugs such as thiazide diuretics should be highly utilized.

Whatever are the hypertensive drugs used, lowering BP to appropriate targets is the most important. Knowledge of adequate BP targets for hypertensive patients, especially for those with diabetes, chronic kidney disease or CVD was poor in this study, with a general tendency of using higher target levels. The use of inappropriate BP targets contribute significantly to poor rates of hypertension control and thus to persistent related-morbidity and mortality.

We also found that appropriate treatment of hypertensive emergencies were reported by only half of our PCPs. Up to 28.6% of them reported using sublingual nifedipine for this indication. The use of sublingual nifedipine should be avoided because of the risk of complications from unpredictable aggressive BP reduction (24,25).

As found in other developing countries (16,26), the practices of recent graduates from medical school were not better than those of older graduates. This means that even recent graduates from medical schools who are supposed to have updated knowledge are practicing inappropriate medicine. This finding highlight the need for the revision of the teaching curricula in medical schools with regard to the management of hypertension.

Another striking findings of this study is that PCPs relied mostly on pharmaceutical representatives for updates on the management of hypertension. Interestingly, some studies have suggested that limiting the influence of pharmaceutical industry on clinical practice would improve the treatment outcomes of patients with chronic diseases in primary care (27-30). Indeed, interactions between physicians and pharmaceutical representatives increase the chances that the physician will act contrary to duties owed to the patient. Ideally, a physician might both interact with pharmaceutical representatives and also do the research necessary to counteract the commercial bias in their message (27). Unfortunately, significantly less PCPs in our study searched for updates on hypertension management through medical journals or internet. In this situation, the publication of national guidelines could provide accepted consensus on best practice and help physicians to conform to standards.

In Cameroon, there are no guidelines for the

management of hypertension provided by the National Diabetes-Hypertension Control Program. Although physicians can rely on the international guidelines published by either the JNC or the European Society of Hypertension (ESH)/European Society of Cardiology (ESC), it has been suggested that guidelines developed at local level with the consensus of clinicians would be most effective (31). Furthermore, as demonstrated by a Canadian randomized controlled trial, a simplified hypertension treatment algorithm could be significantly more effective than guideline-based practice (32). Such a hypertension treatment algorithm developed for local implementation in Cameroon should encourage the use of highly affordable and available antihypertensive drugs like thiazide diuretics.

Almost all our participants were willing to participate in training sessions on updated management of hypertension. Structured continuing medical training on hypertension alongside with the provision of a simplified hypertension treatment algorithm to PCPs would improve hypertension control in our setting as it has been demonstrated elsewhere (32-34).

Conclusions

PCPs' knowledge and management of hypertension is poor in this region of Cameroon. There is a need for continually updating the teaching curricula of medical schools with regard to the management of hypertension. All physicians involved in the management of hypertensive patients should receive continuing medical education, and a simplified hypertension treatment algorithm should be conceived by local experts in order to develop minimum standards for coherence and uniformity in the management of hypertension. The use of low-price generic thiazide diuretics should be scaled up.

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