

Determinants of hypertension awareness and treatment among patients under cardiology follow-up in a Cameroonian Regional Hospital

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Abstract

Background: There exist few data on arterial hypertension epidemiology and associated factors both in urban and rural part of northern Cameroon. This study aimed to estimate the determinants of awareness, and treatment of hypertension in a Cameroonian population under cardiology follow-up in a regional hospital in the northern Cameroon.

Methods: A cross-sectional survey was conducted in the Ngaoundéré Regional Hospital. Data on behavioral socio-demographic risk factors, anthropometric and blood pressure measurements were collected. Hypertension was defined as a systolic blood pressure ≥ 140 mmHg, or diastolic blood pressure ≥ 90 mmHg, or self-reported antihypertensive medication use.

Results: Study population included 117 hypertensive subjects aged 25-64 years. Overall 40.2% were aware of their hypertension and 65.8 % were on treatment. Multivariate analysis showed that, duration of hypertension: ≥ 10 years (odds ratio (OR) = 29.88, 95% CI [2.97 - 300.16]) and professional occupation (workers (odds ratio (OR) = 14.07, 95% CI: [2.3 - 85.97]), craftsmen/traders OR = 8.43, 95% CI [1.41 - 50.49] compared with inactive population), were directly associated with higher hypertension awareness. Increasing cost of hypertension medication was associated with a lower likelihood of being treated ($p < 0.01$). In multivariate analysis, overweight (OR) = 7.07, 95%, CI: [1.48 - 33.75], obesity (OR) = 3.07, 95% CI: [0.78 - 12.15] and high cost of hypertensive medication (OR) = 0.63, 95% CI: [0.01 - 0.44] were independently associated with treatment of hypertension.

Conclusion: Hypertension is a growing challenge in northern Cameroon. Health promotion programs are needed to improve hypertension awareness and treatment.

Keywords: hypertension, awareness, treatment, Adamawa region, Northern Cameroon

Introduction

Hypertension is a major public health issue, particularly in developing countries as whole. It's now well established that over 80% of the burden of the disease is in low-income and middle-income regions.¹ In 2000 the estimated total number of people with hypertension was 972 million, with 333 million in economically developed countries and 639 million in the developing countries. Moreover the number of adults with hypertension in 2025 is predicted to increase by about a total of 1.56 billion.²

In Africa the emerging data show hypertension prevalence ranging from 16.5% to 33.4% depending on region.^{3,4,5,6} Unfortunately, despite an increasing worldwide prevalence, reports on insufficient awareness and treatment of hypertension remain common.^{7,8,9}

A recent national health survey conducted in Cameroon has shown that, despite the high prevalence of hypertension in male (25.6%) and female (23.1%) subjects, there is still relatively low awareness and treatment among those having hypertension.¹⁰ However, little is known about the factors associated with awareness and treatment of hypertension in our locality. The aim of the present study therefore was to investigate on the socio-demographic and cardiovascular disease risk factors that are susceptible to be associated with awareness and treatment of hypertension in a Cameroonian population in Adamawa region.

Methods

Study Area

This study was carried out at the Ngaoundéré Regional Hospital which serves as a first reference hospital in the Adamawa region. Ngaoundéré is the capital city of the Adamawa Region of Cameroon with a population of approximately 270,000 inhabitants (National population census estimate of 2010). Predominantly, it consists of the people of the Mbum and Fulani origin and serves as the main communication hub between the northern and southern parts of Cameroon. With the presence of the University of Ngaoundéré, a minority of non-indigenous people within the health district originate from the further northern and southern parts of Cameroon.

Clinical and anthropometric evaluation

This was a cross sectional study involving randomly selected patient under follow-up at Ngaoundéré regional hospital. Inform consent was obtained after the participants have been briefed on the study. Participants who gave their consent were provided with self-administered questionnaires to be completed. When the participant could neither read nor write, he or she was helped with a translator or a nurse that could read and write Fulfulde, the prevailing language spoken in the study area. The questionnaire assessed the socio-demographic and health characteristics such as age, gender, marital status, employment status, education level, smoking, duration of illness (hypertension) and cost of hypertension medication. Those who responded to interview were invited to medical examination. The administration of the hospital approved the study protocol.

Blood pressure (BP) was measured twice using standard sphygmomanometer, with participants seated after 5 minutes. For analysis we used the mean of the 2 measurements. High BP was defined as systolic blood pressure (SBP) ≥ 140 mmHg and/or diastolic pressure (DBP) ≥ 90 mm Hg.¹¹ Hypertension was defined as having high BP or using antihypertensive drug therapy. Treatment defined as current use of antihypertensive medication was determined by direct documentation of all medications taken. Awareness of hypertension was defined as answering 'yes' to the question 'have you ever been told that you had high BP'?

Anthropometric measurements were obtained with the participants wearing light clothing and no footwear. Height was measured without shoes, to the nearest 0.1 cm, with subjects standing fully erect on a flat surface, buttocks and shoulders flat to the wall and looking straight ahead. Weight was to the nearest 0.1 kg using digital scale. Body Mass Index (BMI) was calculated as weight (in kilograms) divided by square of the height (in meters square). The BMI classified individuals, using World Health Organization criteria, as normal (< 25 kg/m²), overweight (25-29.9 kg/m²) and obese (≥ 30 kg/m²).¹²

Marital status was coded in 4 classes: Single (living alone), married, widow and divorced. Education was divided in 4 classes: (1) no education; (2) primary education; (3) higher secondary education; and (4) graduate. Occupation status was coded in 3 categories: Inactive, traders/craftsmen, workers. Alcohol consumption was classified into two categories: drinker and non drinker. We distinguished also between nonsmoker, and current smoker. Overweight (overweight or no) and obesity (obesity or no) were considered; participants were also asked about the cost of their hypertensive medication, self reported cost of antihypertensive medication were classified in three level scale: low, medium or high.

Results

Characteristics of the study population

Table 1 gives an overview of the sample characteristics of the study population

A total of 117 hypertensive Cameroonians aged 25-64 years were recruited consecutively for this study. Among them, 42.9% were males; the mean age for the whole population was 53.4 ± 11.4 , nearly 51 % suffering from hypertension for over a year. The population under study was predominantly semi-urban and urban (n= 92, 43. 5%). Regarding the level of education, 30 (30%) patients had no formal education, 27 (21.6%), had primary school education 22 (18.8%) a high school education, 28 (23.9%) a level of graduate and 30 (25.6%) were illiterate. 52 (44%) patient were unmarried, 4 (3.4%) were divorced and 12 (10.3 %) widows. Almost 73 participants presented an abnormality in weight. Alcohol consumption concerns only 22 (18.8%) patients, and most of our population was nonsmokers (n=106; 90.6%). Distribution of patients according to their profession was as follows: inactive (n=46; 44.4%), traders and craftsmen (n=30; 25.6%) workers (n=41; 35%).

Factors associated with hypertension

The proportion of subjects aware and treated for their elevated blood pressure was respectively 40.2% and 65.8%.

Among hypertensive, patients over 40 years old, patients with higher education, workers, smokers, and individuals with high duration of hypertension (more than 5 years) were more likely to be aware of their hypertension diagnosis. The odd ratios for the association between cost of hypertensive medication and awareness of hypertension was respectively 0.35 (OR: 0.35; 95% CI: 0.06 - 2.07) and 0.44 (OR: 0.44; 95 % CI: 0.07 - 2.75) for medium and high cost respectively. The odd ratio for the association between gender and awareness of hypertension was 0.16 (OR: 0.16; CI: 0.04 - 0.69).

In multivariate analysis, awareness of hypertension was directly associated with gender, professional occupation and duration of hypertension. Obese individuals and workers were more likely to be treated for their hypertension. Increasing cost of hypertension medication was associated with a lower likelihood of being treated ($p < 0.01$). In multivariate analysis occupation status, obesity and cost of hypertensive medication were independently associated with treatment of hypertension (Table 2).

Discussion

We examined the factors associated with high blood pressure in a sample of Cameroonian population. We observed in the present study that the rate of awareness and treatment of hypertension were respectively 40.2% and 65.8%; Compared with develop countries the proportion of hypertensive aware and treated for the disease was considerably low.^{13, 14} It is possible that differences in perceived benefits of screening for high blood pressure as well as socio economic factors influencing health conditions could explain this difference.^{15, 16}

In the present study, we found that independent determinants of hypertension awareness in Ngaoundéré, Cameroon, included gender status and duration of hypertension. We also found that obesity and cost of hypertensive medication were independently associated with treatment of hypertension while professional occupation was independently associated with both awareness and treatment of hypertension.

Although numerous study have assessed a relation between professional status and occurrence of hypertension,^{17,18,19} little is known about the association between awareness and treatment of hypertension among different socio-professional activities. It has been suggested that, white collar workers were more likely to be aware of their high blood pressure compared to people of other professional activities.²⁰ We found that occupational status was associated with hypertension awareness and treatment: workers were more likely to be aware of and to be treated for hypertension compared with craftsmen, traders and inactive people; this may reflect in part, their greater access to medical care through systematic and regular medical visits at the workplace.

We also found relationship between increased duration of hypertension and higher awareness of hypertension. Hypertensive patients with long term hypertension have been reported to be patients with high risk for complication²¹, and therefore, it was not surprising that increasing duration of hypertension led to higher awareness of the disease.

One of the major finding of this study was the poor association between education level and awareness of hypertension in our sample. In the present study, higher educational status did not translate into higher awareness of hypertension.

These findings deserve particular attention and highlight the need for measures of information and health education within populations independently of their educational level. Also, the present study did not show a significant association of marital status and awareness of hypertension; in the present study, those who were married did not have better awareness of hypertension than their bachelor counterparts; We expected a higher rate of awareness and treatment in the group of married, reflecting higher health concerns in this category of population.^{22,23,24} This anticipated pattern was not confirmed, and hence we hypothesized that socio-cultural factors may have contributed to this findings.

With regard to the cost of antihypertensive medication, our work strongly suggests that, when the price of drugs was high, the lower was the rate of patients treated. These findings are consistent with many previous reports.^{25,26,27} In a study on Chinese population, Meng et al.²⁸ reported that, among hypertensive patients aware of their conditions, the primary reason for not taking antihypertensive medication was the poor economic status. A similar observation was made by Agyeman in Ghana.²⁹

This positive correlation between cost of antihypertensive medication and the rate of hypertension treatment identifies a major determinant of treatment of hypertension on which could be based health policies for the management of hypertension.

The strong association between obesity and likelihood to be treated for hypertension has been reported in numerous studies.^{30,31,32,33} Our findings support this observation.

Conclusion

This study provided important information on the determinants of hypertension. It has shown that, in our setting:

- (1): professional status, gender and duration of treatment were related to awareness of hypertension;
- (2): weight status and employment status were related to pharmacological treatment of hypertension;
- (3) professional status was related to awareness and treatment of hypertension;
- (4): cost of hypertensive medication was independently associated with treatment of hypertension.

Obtained data on determinants of hypertension awareness and treatment offer possibilities to improve hypertension related interventions for prevention and control of the disease in both population of Ngaoundéré regions and similar populations. Measures of sensitization of all the social layers should be the main aim of the strategy of prevention of arterial hypertension locally.

Further research is needed in order to determine other potential factors that might be associated with hypertension awareness and control in our setting.

Conflict of interests: None declared.

Authors' contributions

- a. Conception and design: Pancha OM, Yiagnini E
- b. Acquisition of data: Koona Koona A, Cacko J
- c. Interpretation of data: Pancha OM, Yiagnini E, Koona Koona A
- d. Drafting of manuscript: Pancha OM
- e. Critical revision: Ndofo P, Yiagnini E

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Table 1: General characteristic of the study population

Parameters	Patients characteristics	N	%
Age group (years)	< 40	17	14,5
	40 – 49	27	23,1
	≥ 50	73	62,4
Sex	Female	56	47,9
	Male	61	52,1
Marital status	Single	52	44,4
	Maried	49	41,9
	Widows	12	10,3
	Divorced	4	3,4
Area of residence	Rural	25	21,4
	Urban	92	78,6
Education level	illiterates	30	25,6
	Primary school	37	31,6
	High school	22	18,8
	Graduate	28	23,9
Occupation	Inactifs	46	39,3
	Craftsmen / Traders	30	25,6
	Workers	41	35,0
Tobacco	Non smokers	106	90,6
	Current smokers	11	9,4
Alcohol	No	95	81,2
	Yes	22	18,8
Overweight	Overweight patients	79	67,5
	Non overweight patients	38	32,5
Obesity	Non obese individuals	82	70,1
	Obese individuals	35	29,9
Duration of the disease	< 1 year	55	47,0
	1 - 4 years	27	23,1
	5 - 9 years	23	19,7
	≥ 10 years	10	8,5
	Unknown	2	1,7

Table 2: Multivariate logistic regression of factors associated with awareness and treatment of hypertension

Determinants	N	Awareness		Treatment	
		%	Odds ratio (95% CI)	%	Odds ratio (95% CI)
Age group (years)					
< 40 (R)	17	29.4	1.00	52.9	1.00
40 – 49	27	51.9	5.01 [0.64 - 38.89]	85.2*	5.00 [0.62 - 40.23]
≥ 50	73	38.4	1.12 [0.16 - 7.67]	63.0	1.19 [0.21 - 6.85]
Sex					
Female (R)	61	42.9	1.00	66.1	1.00
Male	56	37.7 **	0.16 [0.04 - 0.69]	67.2	2.98 [0.48 - 18.45]
Marital status					
Single (R)	52	40.4	1.00	69.2	1.00
Married	49	42.9	1.33 [0.35 - 5.05]	67.3	0.96 [0.24 - 3.91]
Widows	12	33.3	0.21 [0.01 - 3.08]	66.7*	7.70 [0.77 - 76.65]
Divorced	4	25.0	0.24 [0.01 - 5.45]	25.0	1.06 [0.06 - 19.07]
Areas of residence					
Rural (R)	25	28.0	1.00	68.0	1.00
Urban	92	43.5	1.93 [0.45 - 8.32]	66.3	0.77 [0.18 - 3.22]
Educational level					
illiterates (R)	30	30.0	1.00	63.3	1.00
Primary school	27	21.6*	0.19 [0.03 - 1.06]	59.5	0.95 [0.20 - 4.56]
High school	22	59.1	0.63 [0.1 - 3.82]	68.2	0.59 [0.09 - 3.74]
Graduate	28	60.7	0.34 [0.05 - 2.48]	78.6	2.79 [0.27 - 28.92]
Occupation					
Inactifs (R)	46	23.9 *	1.00	54.3*	1.00
Craftsmen / Traders	30	43.3 *	8.43 [1.41 - 50.49]	63.3**	7.49 [1.07 - 52.55]
Workers	41	56.1 **	14.07 [2.3 - 85.97]	82.9**	10.78 [1.31 - 88.83]
Overweight					
No (R)	79	41.8	1.00	62.0	1.00
Yes	38	36.8	0.36 [0.08 - 1.58]	76.3**	7.07 [1.48 - 33.75]
Obesity					
No (R)	82	39.0	1.00	65.9	1.00
Yes	35	42.9	0.34 [0.09 - 1.35]	68.6*	3.07 [0.78 - 12.15]
Cost of hypertension medication					
Low (R)	27	35.5	1.00	74.2***	1.00
Medium	31	50.9	0.35 [0.06 - 2.07]	79.7	0.87 [2.27 - 111.58]
High	41	22.2	0.44 [0.07 - 2.75]	25.9***	0.63 [0.01 - 0.44]
Duration of the disease					
< 1 year (R)	55	18.2 **	1.00	60.0	1.00
1 - 4 years	27	40.7	3.95 [0.85 - 18.37]	85.2	4.55 [0.68 - 30.27]
5 - 9 years	23	78.3 ***	53.92 [7.61 - 382.28]	56.5	0.24 [0.04 - 1.42]
≥ 10 years	10	70.0 **	29.88 [2.97 - 300.16]	70.0	0.69 [0.08 - 6.31]
Unknown	2	50.0	1.16 [0.02 - 62.74]	50.0	0.72 [0.12 - 42.02]
All individuals	117	40.2	-	65.8	-

* $P < 0.1$ ** $P < 0.05$ *** $P < 0.01$, CI = confidence intervals