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European Society
of Cardiology

May Measurement Month 2019: an analysis of blood pressure screening results from Republic of the Congo

Bertrand Ellenga-Mbolla^{1,2*}, Jospin Makani-Bassakouahou²,
Christian Kouala Landa^{1,2}, Mary-Gaby Monabeka¹, Paul-Macaire Ossou-Nguet¹,
Solange Mongo Ngamami^{1,2}, Tony Eteni Sinomono¹, Sabrine Bouithy³,
Stéphane-Méo Ikama^{1,2}, Arlette Ngouma⁴, Henri G. Monabeka¹,
Kivié Ngolo-Letomo², Thomas Beaney^{5,6}, Jonathan Clarke⁷, and Neil R. Poulter⁵

¹Faculty of Health Sciences, Marien Ngouabi University, n°1, avenue des 1ers jeux africains, PO Box 2672, Brazzaville, Republic of the Congo;

²Department of Cardiology, University Hospital of Brazzaville, 13 Bd Auxence Ikonga, Brazzaville, Republic of the Congo;

³Department of medicine, Hopital de Base de Talangai, 35 avenue des trois martyrs, Brazzaville, Republic of the Congo;

⁴Department of cardiology, General Hospital Adolphe Cisé of Pointe-Noire, n°6 rue Fayette Tchitembo, PO Box 657, Pointe-Noire, Republic of the Congo;

⁵Imperial Clinical Trials Unit, Stadium House, Imperial College London, 68 Wood Lane, London W12 7RH, UK;

⁶Department of Primary Care and Public Health, Imperial College London, St Dunstan's Road, London W6 8RP, UK;

⁷Department of Mathematics, Huxley Building, South Kensington Campus, Imperial College London, London SW7 2AZ, UK

KEYWORDS

Hypertension;
Blood pressure;
Screening;
Obesity;
Alcohol intake;
Sub-Saharan Africa

The aim of this study was to determine the proportion with hypertension among an opportunistic sample of the population of the Republic of the Congo. Screening was conducted during the period from 15 May to 15 June 2019. Participants included, consenting persons 18 years of age and over, from five cities: Brazzaville, Pointe-Noire, Oyo, Owando, and Ouesso. In total, 3157 participants were screened as part of the campaign. The mean age was 44.7 years (SD: ± 14.9), and 47% were male. Based on the total participants, 881 (27.9%) were overweight and 447 (14.2%) were obese. A total of 583 (18.5%) participated in MMM 2017 or 2018 screenings. The proportion with hypertension was 33.5% ($n=1057$), 42.6% of those were aware and 37.3% were taking antihypertensive medication. Of the participants on treatment, 62.4% were controlled ($<140/90$ mmHg). Overall, 23.3% of patients with hypertension were controlled. After imputation, the proportions with hypertension were 30.1% ($n=1475$) according to standardized age and sex. Obesity ($P<0.001$) and alcohol intake ($P<0.001$) were associated with higher BP compared with normal weight and non-drinkers, respectively. With regards to the social disparities of the different regions of Congo, large scale screening is necessary, in order to report the real situation of hypertension. This will improve the overall management policy for this condition in our country.

* Corresponding author. Tel: +242 066 375 963, Email: fikabertrand@yahoo.fr

Introduction

The Republic of Congo was involved in the International Society of Hypertension (ISH) May Measurement Month (MMM) campaign since its launch by Professor Neil Poulter.¹ Since then, in 2018 and 2019, screening of hypertension was carried out worldwide in more than 100 countries and showed a prevalence of 34.9% and 33.4%.^{2,3} In the Republic of the Congo, screening had been carried out only in the city of Brazzaville in 2017, and the proportion of hypertension was 41.0%, and hypertension awareness was 40.2%.⁴ In 2018, screening was extended to some cities in the south of the country, including rural areas.⁵ Thus, the proportion of hypertension was 22.2%.⁵ Hypertension remains the leading provider of hospitalizations in the department of cardiology at Brazzaville, and 42.5% of deceased patients had hypertension.⁶ Hypertension is the leading cause of heart failure, death, and stroke.^{6,7} These conditions are difficult to manage because of their increasing cost, and the poverty of the population.^{8,9} It is imperative to improve the mapping of hypertension in the Congo, so we participated in the screening as part of MMM19 to help estimate the size of the hypertension problem in the Congo.

Methods

Study coordinator(s) were provided by B.F.E.M. Ethical clearance was obtained by the ethics committee of health sciences (CERSSA n°001/2019). Screening was carried out for 2 weeks at each site, during the period from 15 May to 15 June 2019. Those included in the study were consenting persons aged 18 years and over, with no disabling signs or pathologies. A total of 15 sites were set up in five cities: two in the south of the country (Brazzaville and Pointe-Noire) and three in the north (Oyo, Owando, and Ouesso). The screening was carried out in health posts or in companies. A total of 46 volunteers were trained with the support material provided online by the ISH. The activity was voluntary, and only donations in kind were received from private or public partners. An information campaign by the media and Ministry of Health promoted some campaign awareness to the population before the screening. The

equipment used included measuring rods and scales (GIMA, Italy), as well as OMRON (M3 HEM7131) automatic blood pressure (BP) device (donated to the ISH by OMRON Healthcare). The BP measurement protocol was recommended by the ISH (three readings).³ Definition of hypertension was a systolic BP ≥ 140 mmHg or a diastolic BP ≥ 90 mmHg or on treatment for hypertension. According to body mass index (BMI), underweight was defined as < 18.5 kg/m², overweight 25–29.9 kg/m², and obesity ≥ 30 kg/m².

The data collected were similar to those of MMM 2017 and 2018.^{1,2} Data were collected -via hard copy and Excel Microsoft. Data were cleaned locally by Mrs César Nzahou, BFEM, CMKL, and JKMB. All data were analysed centrally by the MMM project team, and multiple imputation was performed to impute the mean of the second and third BP readings where this was missing.³

Results

In total, 3157 persons were screened. The mean age was 44.7 years (SD: ± 14.9), and 47% were male. All participants screened were black Africans 134 participants (4.2%) were underweight, while 881 (27.9%) were overweight and 447 (14.2%) were obese. Two hundred and eight participants (6.6%) consumed alcohol at least once per week. In total, 3.9% ($n = 123$) took aspirin, and 52 (1.6%) took statins. Of those screened, 583 (18.5%) had participated in MMM 2017 or 2018.

The proportion of participants with hypertension was 33.5% ($n = 1057$), and 42.6% of those with hypertension were aware. The proportion of hypertensive participants on medication was 37.3% ($n = 394$), and 62.4% of those under treatment had controlled BP ($< 140/90$ mmHg). Overall, 23.3% of all hypertensive participants had controlled BP.³

Blood pressure varied significantly by weight and the change of BP according to underweight, overweight, obesity, and alcohol intake, adjusted for age and sex (with an interaction), and antihypertensive medication, is reported in *Table 1*.

Table 1 Differences in blood pressure according to underweight, overweight, obesity, and alcohol intake status, adjusted for age and sex (with an interaction), and antihypertensive medication

Model	Predictor	Difference in BP compared to those with healthy weight or non-drinkers (mmHg)	Standard error	<i>t</i> value	<i>P</i> value	95% confidence interval	
						Lower	Upper
Systolic BP	Underweight ^a	-5.72	1.97	-2.90	0.004	-9.58	-1.85
	Overweight ^a	1.72	1.02	1.69	0.091	-0.27	3.72
	Obese ^a	5.37	1.24	4.33	<0.001	2.94	7.80
	Alcohol intake ^b	5.79	1.63	3.56	<0.001	2.60	8.98
Diastolic BP	Underweight ^a	-2.03	1.24	-1.63	0.103	-4.46	0.41
	Overweight ^a	2.11	0.65	3.27	0.001	0.84	3.37
	Obese ^a	4.13	0.77	5.37	<0.001	2.62	5.63
	Alcohol intake ^b	2.21	1.03	2.15	0.032	0.19	4.22

^aCompared to those of healthy weight.

^bOne or more time per week compared to those who never drink alcohol or drink it rarely.

Discussion

The proportion of participants with hypertension was 33.5%, and 42.6% of those with hypertension were aware they had raised BP. The proportions of hypertension treated (37.3%) and controlled (23.3%) were low. These findings indicate not only problems related to the screening of hypertension, but also the low level of treatment of patients, which may reflect that treatment remains expensive for very low-income populations.^{8,9}

These results differ from those reported during previous MMM screenings. In 2017, screenings were conducted in the city of Brazzaville only. And the proportion of hypertension was 41%, hypertension was not controlled in 66% of cases.⁴ This may be explained by the higher standard of living of urban populations, and their lifestyle, exposing them to greater risk of cardiovascular diseases.⁹ During the MMM 2018 screening, the proportion with hypertension was lower (22.2%), of whom 36.0% were treated, and 16.0% controlled. These differences may be related to the inclusion of the cities of Pointe-Noire and Nkayi, which are semi-urban and especially rural.⁵ The screening method used in MMM19 has some limitations. We did not by design, select a representative sample of the population and it would be better to target a broader selection of urban and rural areas across the country. This would make it more likely to reflect the true state of hypertension management in the country.

Due to the wide social disparities of the different regions of the Congo, with a high average poverty rate (47.0%),⁹ results of representative sampling will influence the overall management policy for this condition in our country.

Acknowledgements

Maurille Elenga, Didace Kouakou from Ajanta Pharma, Dr Gakosso Elie, Head of General Hospital of Owando, Head of General Hospital Adolphe Cisé, Dr Obissi Dominique, Medical Centre of Mokeko, Cabinet de cardiologie de Brazzaville, Hospital Maman Mouebara at Oyo.

Funding

This work was supported by the Ajanta Pharma, EMR-pharma, Servier Congo, and Ethica Congo.

Conflict of interest: none declared.

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