European Heart Journal Supplements (2020) **22** (Supplement H), H33–H36
The Heart of the Matter
doi:10.1093/eurheartj/suaa019

ESC
European Society
of Cardiology

May Measurement Month 2018: blood pressure screening results in Cameroon

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KEYWORDS
Hypertension;
Blood pressure;
Screening;
Treatment;
Control

Hypertension is a global public health challenge, but awareness, treatment, and control rates remain low. May Measurement Month (MMM) creates a platform for awareness creation and opportunistic screening which can identify significant numbers with raised blood pressure (BP). We present results of the 2018 edition of MMM in Cameroon. A cross-sectional survey of self-selected volunteers aged $\geq$18 years was conducted in May 2018. The definition of hypertension and statistical analyses followed the standard protocol. Data were collected from 28 public (indoors and outdoors) and private locations which were assigned unique site identification numbers, over a 30-day period. Of the 8883 participants screened, 53.8% were male and the median age was 35 (interquartile range 21) years, and 30.0% reported not having a previous BP measurement. After imputation, 1867 (21.0%) were hypertensive, 645 (34.5%) were aware of their diagnosis, and 507 (27.2%) were on antihypertensive medication, among whom 242 (47.8%) had controlled BP. In linear regression models adjusting for age, sex, and the use of antihypertensive medication, systolic and diastolic BP were significantly higher in participants aware of their diagnosis, those on antihypertensive medication, and who reported alcohol intake of 1–3 times per month and, one or more times per week. Hypertension prevalence is the lowest, and awareness, treatments, and control rates the highest reported in epidemiological studies in Cameroon in the last two decades. Further surveys will be useful in evaluating the impact, if any, of the MMM campaign on the burden of hypertension in the Cameroon.

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Introduction

Hypertension is a global public health challenge[1,2] and the most prevalent modifiable cardiovascular risk factor.[3-5] Varying estimates of the prevalence of hypertension in Africa have been reported,[6] all of which indicate an upward trend over time.[7] Worldwide, at least a billion adults are reported to be hypertensive with an estimated rise by half a billion by 2025.[4] In sub-Saharan Africa, hypertension has been predicted to increase by 89%, compared with 24% in industrialized countries.

A cluster-specific cross-sectional survey in urban Cameroon reported an age-standardized prevalence of 29.7%, with an awareness rate of 14.1%.[4] Hypertension has also been reported to be implicated in 75.1% of hospitalizations for cardiovascular emergencies resulting in 31.8% mortality, and with stroke and heart failure topping the chart.[8] Elevated blood pressure (BP) is a known predictor of post-haemorrhagic stroke mortality.[9]

Data from the Prospective Urban Rural Epidemiology study report that less than half of hypertensive patients are aware of their diagnosis and less than half of those on treatment are not controlled.[10] Even if treatment and control rates among hypertensives remain suboptimal, increasing awareness through aggressive and widespread screening for raised BP can potentially lead to a reduction in the burden of the disease. The May Measurement Month (MMM) aimed to highlight the importance of measuring BP and to identify and reduce the BPs of over 2 million people who require intervention according to current guidelines.

The main objectives of MMM17[11] were to present data on untreated hypertension in order to influence the policies to address the gap. Of the 16 093 participants screened, 29.2% were hypertensive, 19.8% were not receiving antihypertensive treatment, and 57.2% of those on antihypertensive therapy were uncontrolled.

MMM17 was a huge success and demonstrated clearly that routine opportunistic screening can potentially provide relevant data for hypertension control-related interventions. It also highlighted the need for similar large-scale screenings in future, thus MMM18.

Methods

Details regarding the broad design, specific methods of the MMM approach have been described previously.[12] The Cameroon Cardiac Society (CCS) led to the coordination of the MMM in collaboration with the Clinical Research Education, Networking and Consultancy (CRENC), a not for profit research organization, and Fondation Coeur et Vie (FoCev). Classical, social media, publicity in markets, and churches were used to promote the event.

Unique site identification numbers were assigned to 33 locations in rural, semi-urban, and urban settings but 28 sites recruited participants. Volunteers were selected and trained on proper BP measurement techniques using the automated and manual BP measuring devices, data collection on paper forms, and entry into the MMM18 App or Microsoft Excel sheets.

Screening lasted between May 8 and June 8 and data submission was completed on July 31. Data were collected in public arenas (churches, markets, offices) and homes. Height and weight were measured when feasible, otherwise, they were estimated. Three BP measurements were taken using automated or manual devices depending on which were available. Hypertension was defined as a systolic BP (SBP) $\geq$140 mmHg or diastolic BP (DBP) $\geq$90 mmHg or taking antihypertensive medication. Where either of the 2nd or 3rd readings were missing, multiple imputation was performed to estimate the mean, using the global data.[13] Data from 20 sites were submitted through the MMM18 App and the remainder on spreadsheets. Initial data cleaning was done locally by the CRENC team and later sent to MMM project team for further cleaning and analyses. A full description of the statistical analysis is available elsewhere.[12]

Results

A total of 8883 participants were screened, of which 53.8% were male and 98.8% were black, 0.3% white, 0.1% East Asian, 74.5% were fasting, and 6.5% were pregnant. The median age was 35.0 years [interquartile range (IQR) 21.0] and there were more participants between 18 and 29 than any other age group (35.7%). The majority of participants (74.7%) were screened at public-outdoor areas, and 30.0% reported not having a previous BP measurement while 43.7% reported a BP recording within the past 12 months, and 6.1% were screened in MMM17. With regard to self-reported conditions, 3.9% had diabetes, 1.9% and 0.9% reported a history of myocardial infarction and stroke, respectively.

Of 8883 participants, 45.6% either abstained or only rarely consumed alcohol, 11.8% consumed alcohol at least once/week, and 8.5% were current smokers. The median (IQR) body mass index (BMI) was 25.7 (6.5) kg/m^2, and 39.0%, 32.5%, and 20.8% had a healthy weight, were overweight, and were obese, respectively. Of the 8674 persons for whom a BP measurement arm was indicated, 6908 (79.6%) measurements were done on the left arm. Blood pressure measurements in these participants were achieved on different days of the week and most measurements were done on Friday and fewest on Sundays.

After multiple imputation, 1867 (21.0%) were hypertensive, of which 645 (34.5%) were aware of their diagnosis, and 507 (27.2%) were on antihypertensive medication. Among those on antihypertensive medication, 242 (47.8%) had controlled BP, and of the 8376 participants not on antihypertensive medication, 16.2% were found to have hypertension.

In linear regression models adjusted for age, sex, and the use of antihypertensive medication, SBP and DBP were higher ($P < 0.0001$) in participants with previously diagnosed hypertension, those on antihypertensive medication, and who reported alcohol intake of 1–3 times per month and, one or more per week. Systolic BP only, was higher ($P < 0.0001$) among participants with diabetes but significantly lower in those who were underweight. Systolic BP and DBP rose steadily across BMI categories (*Figure 1*). Only DBP was lower ($P < 0.0001$) in pregnant women.

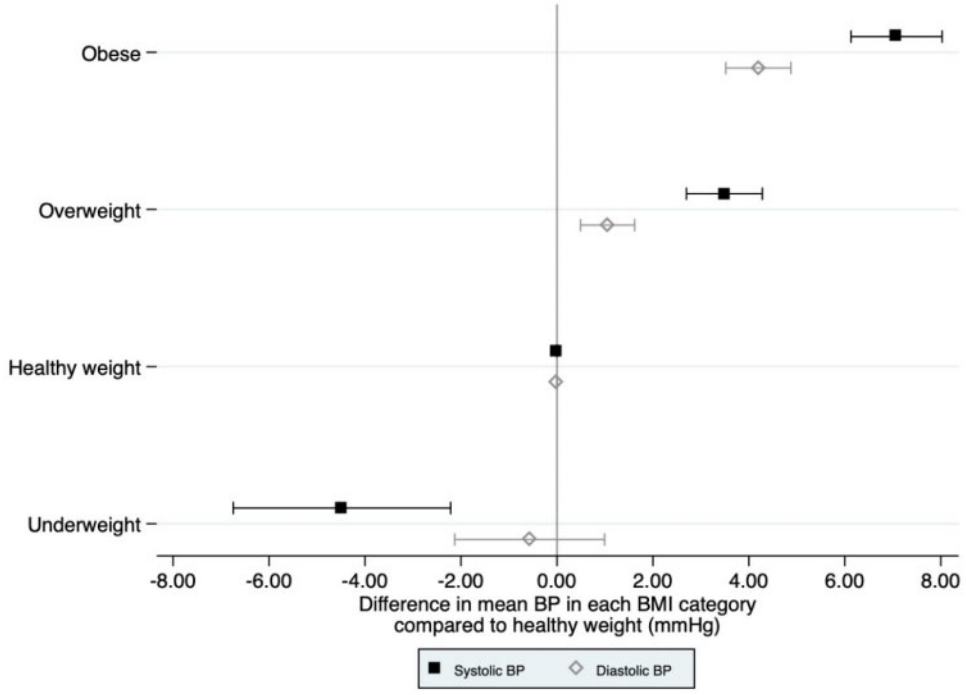

Figure 1 Difference in mean blood pressure across body mass index categories from linear regression model adjusted for age, sex, and antihypertensive medication, with health weight as the reference group.

Discussion

MMM18 is the 2nd edition of the global BP screening campaign in the month of May, and the number of participants screened was somewhat above half of those screened in MMM17 in Cameroon. Of the 8883 participants screened, one-fifth had hypertension, slightly above a 3rd of these were aware of their diagnosis and slightly fewer than a 3rd were receiving antihypertensive medication. Among those receiving antihypertensives, less than half were controlled. This proportion of hypertension is the lowest reported from epidemiological studies in Cameroon in the last two decades, including reports from MMM17, a nationwide survey in Cameroon[4] and a systematic review and meta-analyses of studies hypertension prevalence across Africa published between 2000 and 2013,[14] while awareness, treatment, and control rates were the highest. These improvements in rates of awareness, treatment, and control may be overestimated due to the smaller sample, compared to similar surveys published recently or due to the sample not being nationally representative, but control rates are double that of reports by Dzudie *et al.*[15] with an even smaller sample of self-selected urban dwellers. Whether these numbers are a reflection of progress in efforts directed at detection, management, and control of hypertension in Cameroon or represent the effects of other long-standing actions is subject to debate. A possible contribution of the MMM preventive action can also not be ruled out. Further surveys will be useful to continue raising awareness and evaluating the impact of MMM campaigns on the burden of hypertension in the Cameroon general population.

Acknowledgements

Immense gratitude to all MMM18 Cameroon volunteers, all Cameroonian cardiologists, all doctors and staff from the CRENC and the FoCev, all the participants, the Cameroon Ministry of Public Health, and all other partners who supported this project in Cameroon.

Funding

This work was supported by the International Society of Hypertension, the Cameroon Cardiac Society and the Clinical Research Education, Networking and Consultancy.

Conflicts of interest: none declared.

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