

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

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Hypertension, the foremost cause of global morbi-mortality, is linked with a high mortality from numerous cardiovascular endpoints. The May Measurement Month (MMM) campaign is an annual initiative of the International Society of Hypertension (ISH) to collect information on blood pressure (BP) and other risk factors for cardiovascular disease (CVD) in adults. MMM2019 in the Democratic Republic of the Congo (DRC) was an opportunistic cross-sectional survey of volunteers aged ≥ 18 years that took place in Kinshasa and Mbuji-Mayi after the training of observers to familiarize with the ISH *ad hoc* methods. We screened 29 857 individuals (mean age: 40 years; 40% female). Hypertension was present in 7624 (25.5%) individuals. Of them, 2520 (33.1%) were aware, 1768 (23.2%) on treatment with 910 (51.5%) controlled BP (systolic BP < 140 mmHg and/or diastolic BP < 90 mmHg). Of all hypertensives screened, 11.9% had controlled BP. Of all respondents, 16.7% had participated in MMM18 and 60.5% did not have their BP verified during the last year. Fasting, pregnancy, and underweight status were linked with lower BP levels whilst smoking, drinking, antihypertensive medication, previous stroke, diabetes as well as being overweight/obese were associated with higher BP levels. Our results reflect the high rate of hypertension in the DRC with low levels of awareness, treatment, and control. A nationally representative sample is required to establish the nationwide hypertension prevalence.

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Introduction

Hypertension, the foremost cause of global mortality, is linked with raised mortality from cardiovascular endpoints such as stroke, heart disease, and kidney failure.^{1,2} The May Measurement Month (MMM) events, an annual initiative of the International Society of Hypertension (ISH) to gather information on blood pressure (BP) levels and other risk factors for CVD in adults, took place for the first time in the DRC in 2018 after missing the 2017 campaign. The MMM 2018, organized by the Congolese Hypertension League, took place exclusively in Kinshasa and upheld the dire reality of a hypertension rate (26.1%), with low rates of hypertension awareness (46.3%), treatment (29.6%), and controlled BP (12.7%) in line with previous studies (hypertension rate: 30–46%; hypertension aware: 46.6%; hypertension treatment: 29.3%; controlled BP: 18.3%).^{3,4} A similar description (hypertension rate: 38–41%; hypertension aware: 42.5%; hypertension treatment: 30.5%; controlled BP: 13.6%) has been displayed in Eastern DRC.⁵ In MMM19, the screening was extended to Mbuji-Mayi, one of the most populous cities of the country.

Methods

During 30 days, the MMM19-DRC screening took place in several mostly crowded sites in Kinshasa (Rond-point Ngaba, Masina II, Rond-point Victoire, and UPN). At Kinshasa as well as at Mbuji-Mayi, we also met participants in universities, homes, churches, workplaces, markets, supermarkets, hospitals, and military caserns. A 1 h and a 6-h training session were needed for 36 Congolese Hypertension League volunteers from Kinshasa and Mbuji-Mayi to learn the ISH methods.⁵ They utilized a questionnaire to collect both sociodemographic and risk factors for CVD from participants. Blood pressure measurement technique and cut-off levels (BP definition and control) and monitoring devices used as well as data analysis procedures have been previously described.⁵ Congolese Hypertension League members supported the entire campaign.

Three-seated BP readings were recorded for each participant. Hypertension was defined as systolic BP (SBP) ≥ 140 mmHg and/or diastolic BP (DBP) ≥ 90 mmHg based on the mean of the 2nd and 3rd BP readings or taking antihypertensive treatment. Where the 2nd or 3rd BP reading was unavailable, multiple imputation was used to estimate the mean BP, based on the global data.⁵

Results

The MMM19 campaign (Table 1) enrolled 29 857 participants (mean age: 40 years, women: 40%, blacks: 99.7%, body mass index: 24 kg/m²) of whom 7624 (25.5%) had hypertension, 3.5% were diabetic while 1.8% and 1.0% had previous myocardial infarction and stroke, respectively. Alcohol and tobacco consumption were reported by 46.3% and 14.6% of participants, respectively; 16.7% respondents had participated in the MMM18 campaign whilst 60.5% had not had their BP checked in the last 12 months.

Of the hypertensive participants, 2520 (33.1%) were aware and 1768 (23.2%) were on antihypertensive medication of whom 910 (51.5%) had BP controlled (SBP < 140 mmHg and/or DBP < 90 mmHg). Blood pressure control among all 7624 hypertensive participants was 11.9%. Antihypertensive medication consisted of monotherapy in 636 out of 1768 treated subjects (36.0%) and combined therapy in 747 (42.3%); 1% of participants reported use of aspirin and statins, respectively. Among 28,089 participants not on antihypertensive medication, hypertension was detected in 5856 individuals (20.8%). Out of female participants, 7.4% were pregnant whilst 4.6% had been hypertensive during a previous pregnancy (Supplementary material online, Appendix Table S1).

Figures S1 and S2 illustrate SBP and DBP adjusted as appropriate for age and sex (with an interaction) and/or use of antihypertensive medication. Fasting individuals and pregnant women had lower SBP and DBP levels, which were higher in smokers, alcohol drinkers, diabetics, known hypertensive individuals, and those on antihypertensive medication or with history of previous stroke (Supplementary material online, Appendix Figures S1 and S2). Underweight participants had lower adjusted BP levels while overweight and obese respondents had higher levels than those with healthy weight (Supplementary material online, Appendix Figure S3). Compared with Monday, a trend towards lower BP was seen the other days except Saturday and Sunday.

Discussion

The MMM 2019-DRC results indicate 25.5% of participants had hypertension, 3.5% had diabetes, and 44.3% and 14.6%, respectively, were drinkers and smokers. Among hypertensive individuals, at least a third, nearly one-fourth, and a half of them were aware of their condition, on antihypertensive treatment, and having controlled BP, respectively.

Compared with the MMM 18 results, the current campaign has shown about 60% increase in the number of

Table 1 Total participants and proportions with hypertension, awareness, on medication, and with controlled blood pressure

Total participants	Number (%) with hypertension	Number (%) of hypertensives aware	Number (%) of hypertensives on medication	Number (%) of those on medication with controlled BP	Number (%) of all hypertensives with controlled BP
29 857	7624 (25.5)	2520 (33.1)	1768 (23.2)	910 (51.5)	910 (11.9)

BP, blood pressure.

respondents. While the prevalence of hypertension remains the same, a decrease in the proportion of awareness (13.2%) and antihypertensive treatment (6.2%), was thus noticed among hypertensive participants, with an 8.5% increase in BP control. At least 6 in 10 respondents had their BP never recorded within the last 12 months. This appears higher than the proportion we reported in MMM 2018. Whether the discrepancy is accounted for by the accrual of respondents from two screening settings with potentially different demographic and cultural attributes cannot be ascertained without comparison of data from Kinshasa and Mbuji-Mayi participants. The current hypertensive prevalence is, however, lower than the 30.8% in the VITARAA study,⁶ and the 33.5% in global MMM 2018.⁷

In contrast to the recommendation that about 70% of hypertensive patients require combined therapy.^{8,9} This practice was reported by 42.3% of our treated hypertensive subjects and could well explain the lower BP control rate.

Lower BP levels among fasting, pregnant and underweight participants concur with the literature^{10,11} as well as the higher BP levels among alcohol drinkers, smokers, diabetics, and overweight/obese participants. The presence of higher BP levels in treated hypertensive individuals and in those with a history of stroke indicates a still higher residual CV risk in these patients.

May Measurement Month 2019 has some shortcomings and strong features. The mean of the three BP recordings at one session replace ambulatory BP monitoring or home measurement BP as recommended by current Hypertension Guidelines. Moreover, our sample was neither randomized nor comprehensive which encumbers extrapolation of these data to draw conclusions for the whole country. The campaign has highlighted the need for training of professional care providers to comply with the appropriate guidelines.

However, our results reflect the high prevalence of hypertension in the DRC as well as the low proportions of people aware of their condition, patients treated and with controlled BP. A more comprehensive and randomized MMM campaign is required to evaluate the true nationwide hypertension prevalence.

Supplementary material

Supplementary material is available at *European Heart Journal Supplements* online.

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