

May Measurement Month 2019: an analysis of blood pressure screening results from Zambia

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In Zambia, hypertension accounts for the highest proportion of deaths due to cardiovascular diseases causing 3.3% of all deaths, killing an average of 670 people per year. May Measurement Month (MMM) is an annual global screening campaign aiming to improve awareness of blood pressure (BP) at the individual and population level. Adults (≥ 18 years) recruited through opportunistic sampling were screened at multiple sites within Lusaka during May and June 2019. Ideally, three BP readings were measured for each participant, and data on lifestyle factors and comorbidities were collected. Data were analysed centrally by the MMM project team and multiple imputations were performed where necessary. Of the total of 9232 enrolled, 8.7% of them had never had their BP measured, 2.5% had diabetes mellitus, 1.9% had had a myocardial infarction, 1.5% had had a stroke, 10.6% were current smokers, and 10.0% consumed alcohol once or more per week. Blood pressure fell from a mean of 128.6/82.9 mmHg for the 1st reading to a mean of 123.2/80.0 mmHg for the 3rd reading. The lowest proportion of participants with hypertension was identified by the 3rd reading alone (30.0%). Of all the participants, 30.7% had hypertension, though only 42.6% of them were aware of their diagnosis. Seven hundred and eighty-three (27.6%) were on antihypertensive medication though only 35.0% of them had controlled BP (systolic BP < 140 mmHg and diastolic BP < 90 mmHg). Compared with MMM17 data, there is deterioration of the monitored parameters calling for urgent and accelerated public health policy and clinical practice interventions. We think that the MMM campaign should continue annually to raise awareness of this treatable condition.

Introduction

High blood pressure (BP) is globally recognized as the leading risk factor contributing to morbidity and mortality. In Zambia, hypertension accounts for the highest proportion

of deaths due to cardiovascular diseases.¹ It is said to cause 3.3% of all deaths, killing an average of 670 people per year.^{2,3,6} Measurement of BP therefore remains as the main method for diagnosis. Previously, two efforts to measure the prevalence of hypertension in Zambia were

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initiated by the STEPS Survey,³ which enrolled 4302 respondents and May Measurement Month (MMM17), which surveyed 9607 individuals and found a hypertension prevalence of 25.9%, 80% of participants were not receiving medication and only 7.6% of hypertensives had controlled BP.⁴ May Measurement Month (MMM), a major campaign to raise BP awareness initiated by the International Society of Hypertension (ISH), provides an inexpensive and pragmatic temporary solution to identifying individuals in need of improved hypertension care, whilst raising awareness of the importance of BP measurements at the population level.

Methods

The study utilized the protocol developed by the ISH and as detailed previously.⁵ Volunteers, mostly Hypertension Ambassadors from health professions and training institutions, were trained to measure BP in a cascade manner including materials accessed from the MMM website. Multiple screening sites were set up within Lusaka at shopping malls, institutions of learning, churches, sports grounds, and markets in the months of May and June 2019. Limited mass media campaigns were conducted through television and radio broadcasts. Every occasion was taken to urge the community members to get their BP measured.

Following a brief information interaction, consenting adults (≥ 18 years) were requested to provide a limited amount of information. Due to internet access limitations, the data were entered on paper forms and later transferred to spreadsheets. Three BP readings from the non-dominant arm were made using the OMRON M3 automated BP machines in the sitting position with legs uncrossed, separated by 1- to 3-min intervals. Hypertension was defined as a systolic (S)BP ≥ 140 mmHg or a diastolic (D)BP ≥ 90 mmHg or on medication for hypertension. Health information was provided to all whose BP was raised including hospital referral. The data manager at the Centre for Primary Care Research (CPCR) did preliminary cleaning of the data before transferring it to the MMM project team where the data were analysed following the global approach. The major cost of this exercise was in BP machines. Eighty OMRON M3 automated BP machines were donated by OMRON through the ISH. The local logistics including transportation of data collection tools and volunteers were locally funded.

The survey was co-ordinated by the Zambia Heart and Stroke Foundation (ZAHESFO) and ethical clearance was granted by the University of Zambia Biomedical Research Ethics Committee (FWA00000338: 018-06-12). Data were analysed centrally by the MMM project team and multiple imputation was performed to impute the mean of the 2nd and 3rd readings where this was missing.⁵

Results

A total of 9232 people participated in this survey. Of these, 4799 (52.0%) were women and 4389 (47.5%) were men, with a mean age of 36.8 years. Most participants (99.9%) were of black ethnicity. The majority of participants (67.7%) had their BP measured within the last 12 months,

though 799 (8.7%) individuals had never had their BP measured. Among all participants, 227 (2.5%) reported having diabetes, 177 (1.9%) reported a previous myocardial infarction, and 140 (1.5%) had a previous stroke. The mean body mass index among all patients was 25.8 ± 5.8 , with 24.8% reported as overweight and 17.9% as obese. A total of 983 (10.6%) participants were current smokers and 921 (10.0%) had reported consuming alcohol once or more per week. For a majority of participants (91.0%), this was their first participation in MMM.

The three BP readings were recorded in 8665 participants (93.9%). Analysis of these readings showed that BP fell from a mean of 128.6/82.9 mmHg for the first reading to a mean of 123.2/80.0 mmHg for the 3rd reading (fall of 5.3/2.9 mmHg), whereas the corresponding proportion of participants with hypertension fell from 37.0% to 30.0%. The lowest proportion was identified by the 3rd reading alone (30.0%). After imputation, the age and sex standardized BP was 127.2/81.9 mmHg; but excluding those on anti-hypertensive medication, the standardized BP was 125.3/80.9 mmHg. The most significant change in BP from baseline was noted in the hypertensives on BP medication (15.7/8.8 mmHg) and in all hypertensives (6.3/4.4 mmHg). There were, however, modest decreases in BP in those who were pregnant ($-4.3/-3.5$ mmHg).

Of all the participants, 2836 (30.7%) had hypertension, though only 1,209 (42.6%) of them were aware of their diagnosis and only 274 (9.7%) of them had controlled BP. Among the participants with hypertension 783 (27.6%) were on antihypertensive medication and of these, 65.0% had inadequately treated hypertension. Of the 250 treated hypertensive participants for whom the number of drug classes they were taking was known, 132 (52.8%) were on single-drug therapy, 98 (39.2%) were on two drugs, and only 20 (8.0%) were on three or more drugs. There was very low reported use of statin (1.6%) and aspirin (2.8%) in the whole population.

Discussion

The MMM19 was a build-up on the previous campaigns and included 8401 participants among whom 2838 had never had their BPs measured before or had not had it measured for more than 12 months. In total, 2836 (30.7%) screenees met the criteria for hypertension. Furthermore, 2562 participants were found to have either untreated or inadequately treated hypertension, were given advice on the control of hypertension, and were referred to a primary care facility for effective management. Compared with 2017, the proportion of participants with diabetes was higher (2.5% vs. 2.0%), as well as that of patients with previous stroke (1.5% vs. 0.9%) and myocardial infarction (1.9% vs. 1.4%). The absolute proportion with hypertension was also 4.8% higher and the proportion of hypertensives who had not received treatment increased slightly from 70.0% to 72.4%. Additionally, the proportion of hypertensives with controlled BP dropped from 38.0% to 35.0%.

The number of medication classes taken by treated participants was recorded for the first time in MMM19. More

than half (52.8%) were on a single agent. The global data for MMM19 showed that almost 4 in 10 of those on a single drug were uncontrolled,⁵ supporting the recommendation to initiate treatment with two or more agents.^{6,7} Our current results suggest that if clinic readings are used, the 3rd of the three readings results in the most conservative estimate of hypertension, which is a slight deviation from the global findings and the recommended average of the last two readings.⁶

A weakness of this study stems from a potential selection bias because participants were volunteer-based and opportunistic and not randomly selected. Hence, for example more of those worried about their BP may have presented for measurements with the propensity to an ascertain bias. Additionally, a high majority of participants were recruited from one type of location (outdoor public areas) and Lusaka district, preventing analyses based on location.

MMM carried out in Zambia showed a deterioration in the monitored parameters calling for urgent and accelerated public health policy and clinical practice interventions to meet the sustainable development goal on health. We think that the MMM campaign should continue annually to raise awareness at the individual and population level of this treatable condition, which currently leads to ~670 deaths per year in Zambia.

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