

Blood pressure screening in Mozambique: the May Measurement Month 2017 project—Sub-Saharan Africa

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Elevated blood pressure (BP) is a growing burden worldwide, leading to over 10 million deaths each year. In Mozambique, two national surveys of risk factors for chronic diseases were done, using the WHO STEPWISE approach, the first in 2005 and the last in 2014/2015. In this period of 10 years, the prevalence of hypertension in the adult population increased from 33.1% to 38.9% and the extremely low levels of awareness, treatment, and control did not change significantly. May Measurement Month (MMM) is a global initiative of the International Society of Hypertension aimed at raising awareness of high BP and to act as a temporary solution to the lack of screening programmes worldwide. An opportunistic cross-sectional survey of volunteers aged ≥ 18 years was carried out in May 2017. Blood pressure measurement, the definition of hypertension and statistical analysis followed the standard MMM protocol. Screening was conducted by volunteers, mainly in work places, markets, and religious activities, in the capital city, in most of the provincial capitals and some rural districts. About 4454 individuals were screened with a mean age of 39 years, and, after multiple imputation, 1371 (31.1%) had hypertension. Of individuals not receiving anti-hypertensive medication, 1099 (26.6%) were hypertensive. Of individuals receiving antihypertensive medication, 166 (61.6%) had uncontrolled BP. MMM17 was the largest BP screening campaign undertaken in Mozambique. These results suggest that opportunistic screening is an important tool to identify significant numbers of patients with raised BP.

Background

Hypertension is the leading risk factor for cardiovascular morbidity and mortality worldwide.^{1,2} In Mozambique, a south-east African country, the prevalence of hypertension in adults increased from 33.1%, in 2005, to 38.9%, in 2014/2015.^{3,4} Prevalence of awareness remained under 20% and prevalence of control (among hypertensives) under 4%. The annual incidence rate of stroke,

adjusted for the world reference population, was estimated in 260.1 per 100 000 people aged ≥ 25 years (in a 2005/2006 case registry in Maputo's health units), with overall 33.3% in-hospital and 39.6% 28-day case fatality rate.^{5,6}

The national health system is not prepared to face this new burden, which is expected to increase, given the rapid process of urbanization and globalization.^{7,8} To halt the rise in hypertension-related complications, different solutions for healthcare delivery, including community-based screening and prevention programmes, are needed.

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Methods

The May Measurement Month (MMM) cross-sectional survey was co-ordinated by AMOCOR, the Mozambican Heart Association. The study protocol was approved by the National Bioethics Committee for Health. All participants were ≥ 18 years old and provided verbal informed consent. In Maputo, volunteers were recruited among medicine and nursing students and at provincial level, the heads of local committees of non-communicable diseases co-ordinated the activities. Training and marketing materials developed by the International Society of Hypertension were used. Screening was performed mainly in work places, churches, and markets, throughout the month of May. The campaign was endorsed by the Ministry of Health and promoted by prominent cell phone companies and television programmes.

For blood pressure (BP) recordings, Omron automated devices were used and standardized methods followed, including three-seated recordings, with 1-min intervals between readings. Additional data were collected using a questionnaire, on paper forms, and later transferred to excel spreadsheets and sent to the MMM co-ordination centre for analysis. Hypertension was defined as systolic BP of at least 140 mmHg or diastolic BP of at least 90 mmHg (or both). Participants receiving anti-hypertensive treatment were also assumed to have hypertension. Among those on treatment, controlled BP was defined as BP of less than 140/90 mmHg. Participants with BP in the hypertensive range were provided with printed evidence-based dietary and lifestyle advice to lower BP and referred for further follow-up in the primary healthcare centre.

Results

The mean (standard deviation) age of participants was 39.0 (SD 12.9) years, 51.8% were women and 93.9% were of black ethnicity. Only 6.1% of the participants were taking anti-hypertensive medications (272 of the 4454).

Among screened participants, diabetes was reported by 70 (1.6%), myocardial infarction by 51 (1.2%), stroke by 31 (0.7%), alcohol consumption (once or more per week) by 585 (13.1%), and smoking by 204 (4.6%). Among female respondents, 12 (0.5%) reported being pregnant.

Of the 3846 respondents with three BP readings, there was an average decrease of 4.8/2.6 mmHg between the 1st and 3rd readings (see Supplementary material online, *Table S1*).

The proportion of hypertensive participants, after imputation, was 31.1% (1371 of 4405). The proportion of hypertensives not receiving treatment (excluding those on anti-hypertensive drugs) was 26.6% (1099 of 4133). Of the 269 participants who were receiving anti-hypertensive treatment and had an imputed BP available, uncontrolled BP was found in 166 (61.6%; see Supplementary material online, *Table S2*).

The association between age and sex with BP readings in those not receiving anti-hypertensives showed a linear increase (see Supplementary material online, *Figure S1*). After adjustment for age and sex, significantly higher BP

readings were observed in participants receiving anti-hypertensive treatment (see Supplementary material online, *Figure S2*). Adjusting for age, sex, and anti-hypertensive treatment, BP readings were significantly higher in those with diabetes, a previous history of stroke or myocardial infarction, and, significantly lower in those measured on the left arm, than readings from the comparator groups. Non-significant differences were observed on BP readings, in current smokers and in those drinking one or more alcoholic beverages, from the comparator groups.

Discussion

MMM was the largest hypertension screening activity ever organized in Mozambique. A high proportion of the screened participants were hypertensives (31.1%), very few were using anti-hypertensive medication and most of the former had uncontrolled BP. The lower proportion of hypertension found here may differ from those published previously due to the method of recruitment, which was not random and might under- or over-represent certain groups.

However, MMM was important because it made it possible to diagnose hundreds of unaware hypertensives, raised the levels of awareness of the population regarding hypertension and served as a tool for advocacy to the national authorities of health. In countries where antihypertensive drugs are not widely available, the need created with screening activities, may not be covered by the available health institutions and must be analysed with caution.

Supplementary material

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

Conflict of interest: none declared.

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