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May Measurement Month 2017: Brazilian results—Americas

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Hypertension is a pathology of high prevalence in the world. In Brazil, it is the main risk factor for the major cause of death in the country, coronary heart disease. The May Measurement Month Campaign in 2017 (MMM17) included a population with representation from all Brazilian states and reflects some of the characteristics of hypertension in Brazil. Questionnaire data were collected and three measures of blood pressure (BP) were performed. The sample consisted of 7260 individuals, 40% were white, 56.4% were women. The average age was 52 years. Diabetes was present in 11.9%, previous myocardial infarction in 4.0% and stroke in 2.7%. About 8.4% were smokers and 26.2% were users of alcoholic drinks. The average BMI was 26.9 kg/m^2. Considering the means of the last two measures of BP 47.0% were hypertensive (>140/90 mmHg). Of the individuals who did not use medication, 19.5% were hypertensive and of those who used anti-hypertensive medication 40.0% were uncontrolled. Systolic BP increased with age. The use of alcohol was related to higher BP levels, as well as diabetes and obesity. The MMM17 campaign demonstrated a large number of unknown hypertensives and a high rate of uncontrolled hypertension in Brazil.

Background

Elevated blood pressure (BP) is a growing burden worldwide, leading to over 10 million deaths each year. May Measurement Month (MMM), implemented by the International Society of Hypertension (ISH), is a global initiative aimed at raising awareness of high BP and to act as a temporary solution to the lack of screening programmes worldwide.[1] Measurement of BP is a cheap, simple, and non-invasive technique to detect hypertension and, assuming effective therapy is supplied, leads to highly cost-effective protection against death and disability[2,3] which otherwise usually arises from myocardial infarction, cerebrovascular disease, and renal failure[1]. Cardiovascular disease (CVD), mainly stroke and coronary heart disease, has been Brazil's leading cause of death for half a century. Coronary heart disease, now the leading cause of CVD death, accounted for 31% of CVD mortality, cerebrovascular diseases for 30%, hypertensive heart disease for 14%, and other forms of heart disease (mainly congestive heart failure) for 18%[4]. Therefore, our country got involved with MMM initiative, to verify our current status about this considerable health epidemic.

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Methods

An opportunistic cross-sectional survey of volunteers aged ≥18 was carried out in May 2017. BP measurement, the definition of hypertension and statistical analysis followed the standard MMM protocol.[1] All the main regions of Brazil were included, providing us with representation from the whole country. The most common types of screening sites were hospitals and indexed clinics. Each participant had three seated BP measurements and the mean of readings 2 and 3 was calculated. BP measurement was obtained by automatic Omron devices, on either the right ($n = 3823$, 52.7%) or the left ($n = 3091$, 42.6%) arm (4.8% unknown).

The primary objective was to raise awareness of BP. We measured the number of people screened by Brazilian state, and the number of people who have untreated or inadequately treated hypertension (defined as systolic BP ≥140 mmHg or diastolic ≥90 mmHg, or both, or based on anti-hypertensive medication use. All ethical precepts have been respected. Data were collected by the centres in Excel spreadsheet and analysed centrally by the MMM17 project team steering committee, according to the standard analysis plan.[1]

Results

During MMM17, 7260 individuals from different ethnicities were screened, 2943 white (40.5%), 1163 black (16.0%), 2837 South Asian (39.1%), 233East Asian (3.2%), 37 other (0.5%), and 47 unknown (0.6%). Female gender was more prevalent ($n = 4095$, 56.4%). The mean age was 51.6 years (SD 16.1). Reported rates of relevant comorbidities were: diabetes in 11.9% ($n = 864$), previous myocardial infarction in 4.0% ($n = 289$), and previous stroke in 2.7% ($n = 199$). About 613 individuals (8.4%) were current smokers and 1904 (26.2%) reported alcohol intake once or more per week. The mean body mass index was in the overweight range with 26.9 (SD 4.6) kg/m^2. Considering the mean of the last two BP measurements after imputation,[1] 3396 participants (47.0%) were hypertensive (BP ≥140 or ≥90 or on treatment for hypertension). Of individuals not receiving anti-hypertensive medication, 924 (19.5%) were hypertensive. Of individuals receiving anti-hypertensive medication, 977 (40.0%) had uncontrolled BP.

In the analysis of the difference in mean BP according to the individual characteristics of the linear regression models adjusted for age, sex, and anti-hypertensive medication, we found that anti-hypertensive medication use and alcohol intake were associated with higher systolic and diastolic BP, and diabetes with higher systolic BP (*Figure 1*). In the analysis of the difference in mean BP according to body mass index from linear regression models, adjusted for age, sex, and anti-hypertensive medication, with underweight as the reference category; obese and overweight individuals showed significantly higher systolic and diastolic BP (*Figure 2*).

Discussion

MMM17 is the largest synchronized, standardized, multinational screening campaign of any cardiovascular risk factor ever done. Pending the establishment of BP surveillance systems around the world, this inexpensive annual screening campaign could help offset the enormous health burden

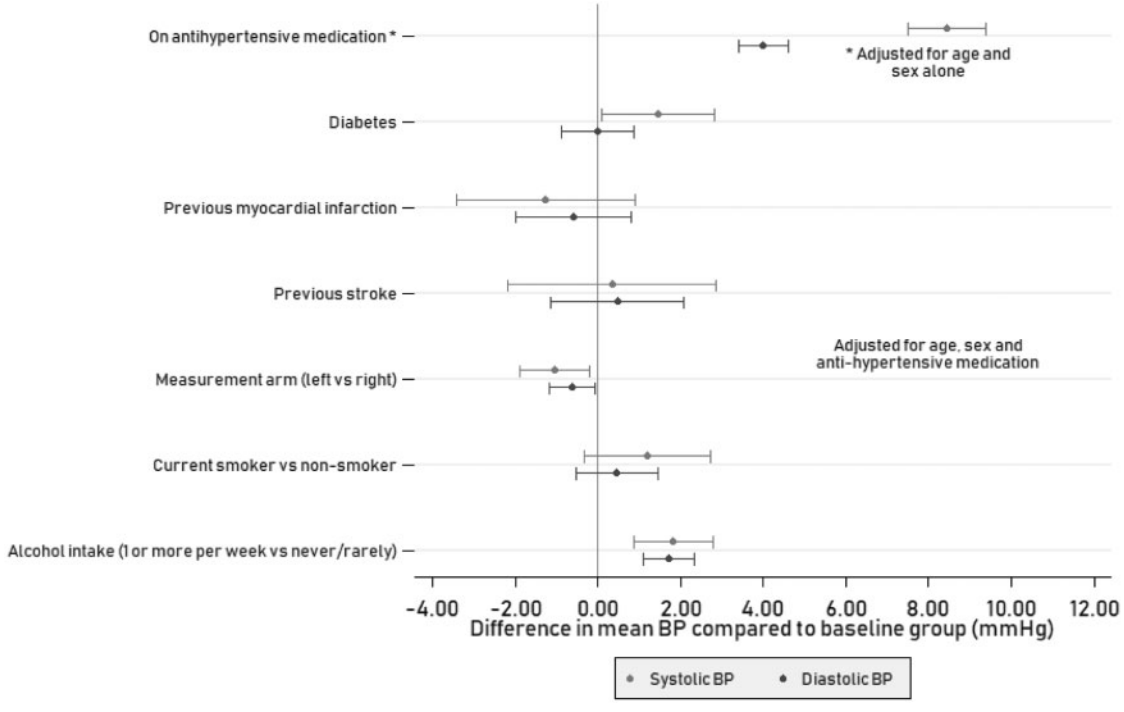

Figure 1 Difference in mean blood pressure according to individual characteristic from linear regression model.

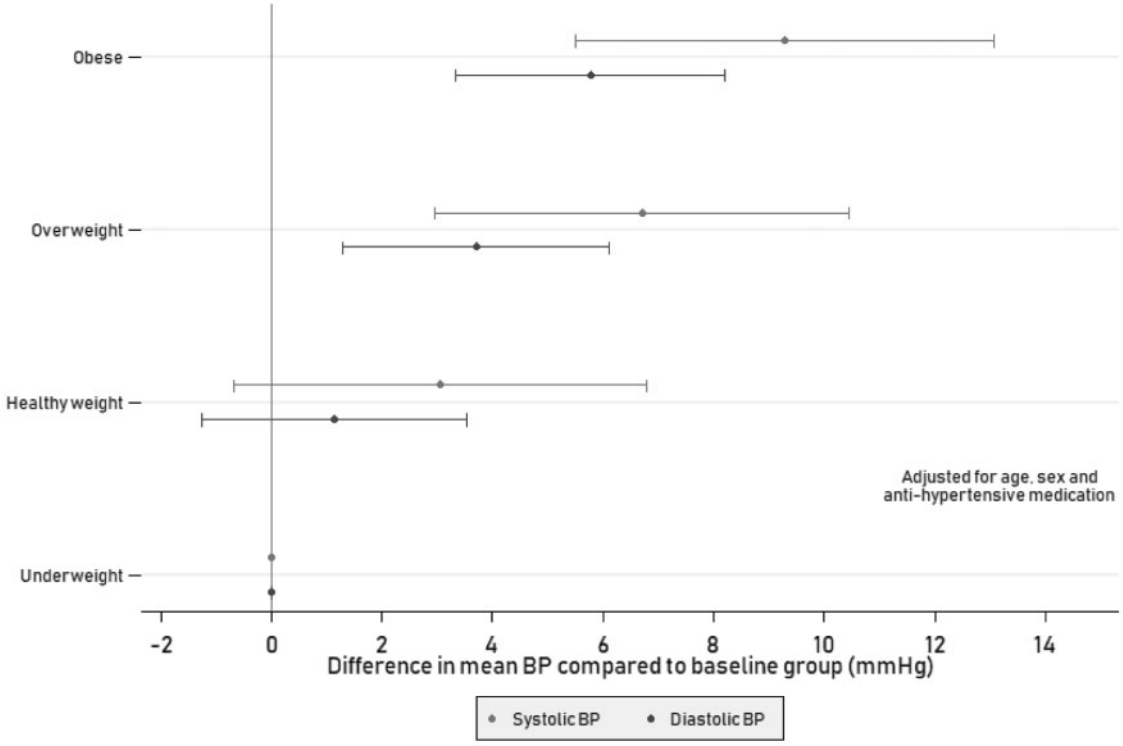

Figure 2 Difference in mean blood pressure according to body mass index from linear regression model.

attributed to increased BP.[1] The MMM17 results may provide an opportunity for a paradigm shift in the Brazilian lifestyle, with more awareness about high BP and the associated risks.

The proportion of hypertensives, treated and controlled (to <140/90) presented in this paper, is in line with data recently published in a prospective cohort[5] that showed that systolic BP increases over the years. This is likely due to the risk factors we are constantly exposed to, including stress, poor diet, sedentary lifestyle, smoking, and others[3].

In conclusion, MMM17 was the largest BP screening campaign undertaken in Brazil. The high percentage of newly diagnosed hypertension and the identification of uncontrolled hypertension despite pharmacologic treatment reinforce the importance of this annual event in Brazil to raise awareness, and to improve the prevention of major adverse cardiovascular events. These results suggest that opportunistic screening can identify a significant number of individuals with raised BP, both off and on treatment.

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