

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

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The Argentinean Society of Hypertension, in agreement with the May Measurement Month (MMM) initiative of the International Society of Hypertension, implemented for the third consecutive year a hypertension screening campaign. A volunteer cross-sectional survey was carried out in public spaces and health centres during the month of May 2019 across 33 cities in Argentina. Hypertension was defined as systolic blood pressure (BP) ≥ 140 mmHg and/or diastolic BP ≥ 90 mmHg based on the mean of the second and third BP measurements, or in those on treatment for high BP. A total of 94 523 individuals (53.9 ± 17.8 years old, 55 231 women and 39 292 men), were evaluated. The age and sex standardized mean BP was 124.7/77.2 mmHg. Among participants, 34.7% were overweight ($25\text{--}29.9$ m/kg²) and 28.7% had obesity (≥ 30 m/kg²). Individuals identified as being overweight had BP 3/2 mmHg higher and individuals with obesity 6/4 mmHg higher than those with normal weight. The prevalence of hypertension was 52.5%. Although 81.1% were aware and 77.7% were on antihypertensive treatment, only 46.0% of all individuals with hypertension had their BP controlled. Moreover, 19.8% of those not on any antihypertensive medication were found with raised BP. The low level of control of hypertension generates the critical need for the development of community-based prevention strategies reinforcing strategies to increase the awareness and control of hypertension.

Introduction

Argentina has an estimated population of ~ 45 million and cardiovascular diseases (CVD) are the leading cause of morbidity and mortality. In the last decade, CVD represents 1/3 of total mortality with ~ 100 000 deaths each year.¹ According to national statistics, the rate of cardiovascular mortality was 220.7 per 100 000 inhabitants (45.2 for stroke

and 175.5 for cardiac disease) in 2017. In the same year, an epidemiological study found that hypertension prevalence in individuals ≥ 18 years old was 36.3% ($\geq 140/90$ mmHg), and the levels of awareness and control were 61% and 24%, respectively. Remarkably, 56% of the patients treated with antihypertensive drugs had not reached the therapeutic goal.² A progressive increase in CV events through the blood pressure (BP) categories were showed in a cohort from

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Buenos Aires province.³ Also, a previously published study estimated that 400 000 years of potential life were lost annually in Argentina due to heart disease and stroke. Hypertension is the risk factor with the greatest impact in both men and in women, responsible for 37.5% of the years of potential life lost, and 36.6% of the years of healthy life lost.⁴

In view of the magnitude of the data, it is clear that special attention must be paid to both hypertension prevention and control. The World Hypertension League has recently summarized the reasons why urgent prevention and control of high BP is necessary.⁵ The Argentinean Society of Hypertension (SAHA) has, among its main objectives, the design and establishment of different strategies intended to improve the knowledge and control of hypertension in our country. In this sense, it is necessary to measure BP regularly in the population and communicate the values and the condition of each inhabitant.

In this direction, the SAHA conducted the program 'Know and Control Your Blood Pressure' and participated in the synchronized and standardized multinational screening campaign of hypertension proposed by the International Society for Hypertension named 'May Measurement Month' (MMM). In the screening campaigns performed in Argentina during 2017 (MMM17)⁶ and 2018 (MMM18),⁷ 6 out of 10 hypertensive patients were either not on treatment or did not reach the BP goal values. In 2019, during the month of May and similar to the previous years, the MMM19 campaign was performed; the main results of this last screening are shown in this manuscript.

Methods

SAHA invited all its associates to participate in the multinational campaign to measure BP in the general population. All of the individuals screened agreed to participate of their own free will. The campaign, co-ordinated by 60 SAHA members, was mainly conducted at hospitals and health centres, although some public spaces and pharmacies were also included. Screening took place in 33 cities in Argentina, representing 15 out of the 23 country states. At the participating centres, artworks and banners announced the campaign and brochures were supplied to the public. Screened volunteers were asked to complete a short questionnaire to gather additional data and their BP was measured two times (in contrast with other MMM studies where three readings were taken) with 1-min intervals between readings, on the left arm (preferably) in a seated position. Omron and Microlife validated automatic devices were used; cuff sizes used were according to the circumference of the arm. This information was entered via a Google form or, alternatively, manually on a spreadsheet. Multiple imputation was used to impute the mean of the second and third BP reading to provide comparable readings with other MMM studies, based on the global data, as described previously.⁸ Hypertension was defined as systolic BP ≥ 140 mmHg and/or diastolic BP ≥ 90 mmHg based on the mean of the second and third BP readings and/or in those on treatment for high BP. Among those treated, controlled BP was

defined as values of $<140/90$ mmHg. Weight and height were self-reported, and body mass index (BMI) was calculated. Those participants classified as hypertensive were provided with visual material detailing dietary and lifestyle advice to lower their BP.

Continuous variables (age, BMI, systolic BP, and diastolic BP) were expressed as mean \pm standard deviation. Proportions were expressed as percent (%). Data were analysed centrally using Stata and *P*-values <0.05 (two-tailed) were considered statistically significant.⁸

Results

A total of 94 523 individuals (53.9 ± 17.8 years old), 55 231 (58.4%) women and 39 292 men (41.6%) were included in the present analysis. After multiple imputation, the age and gender standardized mean BP was $124.7/77.2$ mmHg. The sample had high rates of adiposity: the mean BMI was 28.1 ± 5.4 m/kg², and the prevalence of individuals with BMI > 25 m/kg² was 63.4%, 34.7% were defined as overweight ($25-29.9$ m/kg²), and 28.7% as obese (≥ 30 m/kg²). Individuals that were identified as being overweight and obese had BP levels that were on average 3/2 mmHg and 6/4 mmHg higher, respectively, than those with normal weight.

As *Table 1* shows, 49 666 individuals (52.5%) had hypertension. Although 81.1% were aware and 77.7% were on antihypertensive treatment, only 46.0% of all individuals with hypertension had their BP controlled ($<140/90$ mmHg); in addition, 19.8% of those not on any antihypertensive medication were found with raised BP.

Discussion

The screening campaign performed in Argentina with the slogan 'Know and control your blood pressure' as part of the international MMM19, significantly increased the number of people surveyed compared with the previous edition (~ 20 000 individuals more) and found a high proportion of hypertensive individuals (52.5%), similar to MMM17 (50.4%). This value is higher than those found in epidemiological population-based studies performed in our country (33-35%). As a limitation, and in contrast to the usual MMM protocol only two BP measurements were taken instead of three from participants. However, by using multiple imputation, based upon global data, the mean of the second and third reading could be estimated, to remain consistent with other studies, under an assumption that the differences in subsequent readings in individuals do not vary significantly by country. The level of awareness and treatment among individuals with hypertension (81.1% and 77.7%, respectively) were also higher than those previously communicated in population-based samples.⁹ These differences could be explained by selection bias because the MMM campaign did not include randomized population samples.

The level of control of BP amongst those on medication remains poor and insufficient, with almost half uncontrolled, similar to previous editions of this same campaign. Furthermore, about 20% of those not on any

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

| Total participants | Percentage with hypertension | Percentage of hypertensives aware | Percentage of hypertensives on medication | Percentage of those on medication with controlled BP | Percentage of all hypertensives with controlled BP |
|--------------------|------------------------------|-----------------------------------|---|--|--|
| 94 523 | 52.5 | 81.1 | 77.7 | 59.2 | 46.0 |

antihypertensive medication were found with raised BP. Therefore, raised BP remains a critical health problem in our country. Interestingly, a recently published study performed in Argentina by SAHA members shows that almost 65% of hypertensive patients treated by specialists have adequate BP control.¹ Thus, hypertension control could be improved but the challenge is to design strategies in order to translate this control rate to the primary care level, where most patients are managed.¹⁰

Thus, the low level of control of hypertension also generates the critical need for the development of community-based prevention strategies. Previously published studies showed, in relatively small samples from Argentina, that national BP levels can be decreased and hypertension control can be improved with community-based or multicomponent intervention programs.¹¹

In conclusion, periodic campaigns such as MMM emerge as necessary strategies to increase the awareness of this highly prevalent condition, helping to reduce the enormous health burden attributed to hypertension.

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Conflict of interest: none declared.

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