

May Measurement Month 2017: an analysis of blood pressure screening results in Colombia—Americas

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Despite the availability of efficient methods to evaluate blood pressure (BP) and of safe and efficient medication to treat and control hypertension, the levels of awareness, treatment and control are very low globally, particularly in low- and middle-income countries. To highlight the importance of improving these rates, the International Society of Hypertension (ISH) endorsed by the World Hypertension League have implemented the May Measurement Month initiative. We present here the results obtained in Colombia. The Fundación Oftalmológica de Santander (FOSCAL) led the implementation of this strategy in Colombia and 11 departments participated. The data collection followed the guidelines of the ISH. The information collected was compiled for the report generation and the submission to the Technical Secretariat of the ISH. Data cleaning was performed locally by FOSCAL. Data were collated and analysed centrally. A total of 22 258 participants (58.8% female) were included in the analysis. Mean age was 40.9 ± 17.7 years. Age and sex-standardized BP excluding participants receiving BP medications was 118/74.3 mmHg, and in those on treatment 125/78 mmHg. High BP was present in 5036 (22.8%) individuals, 1637 of 18 644 (8.8%) who were not receiving anti-hypertensive medications were hypertensive, and 961 of 3359 (28.6%) receiving treatment were not controlled. These results highlight the need to develop innovative promotion strategies at individual and population levels to increase the awareness of the importance of BP, and the consequences of not having well-controlled hypertension. This initiative is an effective and easy to implement strategy that should be maintained in the coming years.

Introduction

High blood pressure (BP) is the most important risk factor for premature development of cardiovascular diseases (CVD).¹ Despite the availability of efficient methods to evaluate BP and of safe and efficient medication to treat and control hypertension, the levels of awareness, treatment, and control are very low globally,² particularly in low- and middle-income countries.³ The Prospective Urban and Rural Epidemiology (PURE) study in Colombia, which included 7444 individuals with an age range of 35-70 years old, reported a prevalence of high BP of 37.5%. Only 46.6% of the hypertensive individuals were being treated, 62.9% of the hypertensive individuals receiving medications were not controlled, and 48.1% of individuals with out-of-target BP levels were unaware of their condition.

It is well known that the lack of hypertension control is a factor associated with high rates of CVD. In Colombia, CVD are the leading cause of mortality.⁴ The Colombian National Health Observatory reported a prevalence of hypertension of 31% in women, with an annual increase of 1.4%. In men the prevalence was 28.7%, with an annual increase of 1.2%.⁴ The mortality rate attributable to high BP was 12.7 per 100 000 habitants in women and 13.7 in men. These data highlight the importance of improving the rates of awareness, treatment, and control of hypertension, as one of the key actions to reach the goal of reducing premature mortality due to non-communicable diseases as proposed by institutions such as the World Health Organization (WHO),⁵ the Lancet Commission on Hypertension,⁶ and the Latin America Society of Hypertension.⁷ With this aim, the International Society of Hypertension (ISH) endorsed by the World Hypertension League (WHL) implemented the May Measurement Month (MMM) initiative,⁸ the global results of which have recently been published.⁹ We present here the results obtained in Colombia.

Methods

The initiative was led by Fundación Oftalmológica de Santander (FOSCAL) with the support of LASH, the Red Colombiana para la Prevención de Enfermedades Cardiovasculares y Diabetes (RECARDI) and the Colombian Society of Cardiology. RECARDI was in charge of establishing relationships between the industry, universities, health providers, and territorial health entities. OMRON Healthcare (Pacific region) donated the devices with which BP was measured, and around 400 volunteers participated in the initiative deployment. In Colombia, MMM17 was not submitted to an ethical committee since local regulations state that observational studies do not require ethical clearance.

The principal investigators (PI) of the 11 departments were trained face to face in a 1-day meeting, by FOSCAL personnel. Following this, each department formed field-work teams, of which all were trained by a PI. Four types of sites or environments were addressed by the voluntary participation of health students, community leaders and health promoters, nursing assistants, health professionals, teachers, and researchers: (i) Institutional environments, in waiting rooms and administrative transit areas. (ii) Educational environments, such as universities, through health fairs, student welfare services, research groups, and fixed points in cafeterias and rest areas. (iii) Work environments, through companies with security and health services, human resource offices and through direct approach in working areas, and (iv) community environments, in common places such as supermarkets, parks, community halls, sports areas, and shopping centres.

The work teams used automatic BP monitors (OMRON Model: HEM7121), and aneroid sphygmomanometers (Welch Allyn). The data collection and BP measurement followed the ISH protocol.⁹ Weight and height were measured where possible, but if not possible, self-reported. BP was measured three times, with 2-min intervals between each measurement. Before applying the questionnaire and

measurements, the participant was asked to authorize use of the data being collected. The data were collected in one of three ways, always maintaining anonymity within records: (i) pre-printed digitalized formats which use character recognition in a Form Scanner software, (ii) an online format, accessible from the FOSCAL Research Direction website, and (iii) a mobile application. The information collected was compiled for the report generation and the submission to the Technical Secretariat of the ISH. Data cleaning was performed locally by FOSCAL. Submitted data were collated and analysed centrally.

Results

A total of 22 258 participants (58.8% female) were included in the analysis. Mean age was 40.9 ± 17.7 years. The most common ethnic group was mixed (83.5%), followed by white (13.6%), black (1.9%), and other (0.9%). Mean body mass index (BMI) was 25.4 ± 4.09 . Of all participants, 3399 (15.3%) individuals were on anti-hypertensive medication. A total of 1730 (7.8%) had diabetes, 944 (4.2%) had a previous myocardial infarction, and 525 (2.4%) a previous stroke. About 1579 (7.1%) were current smokers and 2645 (11.9%) reported an alcohol intake of 'once or more per week'.

Mean age and sex-standardized BP was 119.1/74.8 mmHg. Age and sex-standardized BP excluding participants receiving anti-hypertensive medications was 118/74.3 mmHg, and in those on treatment 125/78 mmHg. Hypertension (≥ 140 systolic BP or ≥ 90 diastolic BP or on BP-lowering treatment) was present in 5036 (22.8%) individuals, 1637 of 18 644 (8.8%) who were not receiving anti-hypertensive medications were hypertensive, and 961 of 3359 (28.6%) receiving treatment were not controlled (BP $\geq 140/90$ mmHg).

After adjusting for age and sex, people receiving anti-hypertensive treatment had significantly higher BP (see Supplementary material online, *Figure S1*). Significantly higher BP levels were present in people with diabetes, after adjusting by age, sex, and anti-hypertensive medication. BP was not significantly higher in people with a history of previous myocardial infarction or stroke or in smokers or people with alcohol intake >1 per week. In contrast, BP readings in pregnant women and those measured on the left arm were significantly lower than in relevant comparator groups. Increased BMI, adjusted by age, sex, and anti-hypertensive treatment was associated with an increase in both systolic and diastolic BP (see Supplementary material online, *Figure S2*).

Discussion

MMM17 is the largest survey of BP levels ever implemented in Colombia. After imputation, the proportion of participants with hypertension was 22.8%, of which 8.8% were not receiving anti-hypertensive medications and 28.6% were not controlled despite treatment. The prevalence of hypertension was similar to that reported by the Colombian National Health Observatory in 2014.⁴ However, a higher prevalence of hypertension (37.5%) and of uncontrolled hypertension (62.9%) was reported in the PURE study.³ This

discrepancy could be explained by the average age of the PURE population being 10 years older than in the participants of the MMM17. However, it must also be considered that in the PURE study, BP was measured by fewer, trained individuals, using standardized devices and within controlled conditions, while in the MMM17 initiative in Colombia a larger number of people took measurements, using different devices, and measurements in a variety of less controlled conditions.

Compared with the results of the MMM17 worldwide,⁹ we found a lower proportion of participants with hypertension (22.8% vs. 34.9%), a lower proportion of hypertensive participants who were not receiving anti-hypertensive medications (8.8% vs. 17.3%), and a lower proportion of participants with uncontrolled treated hypertension (28.6% vs. 46.3%).⁹

The invitation to join MMM17 was very well accepted by all the government and non-government health institutions, by the medical scientific societies, the medical schools, newspapers, radio and television, and by the communities where the study was implemented.

In conclusion, the MMM17 initiative was the largest standardized and synchronized BP screening campaign undertaken in Colombia. Our results suggest that opportunistic screening can identify a significant number of individuals with high BP. Moreover, our findings confirm the high proportion of hypertensive individuals that are not aware of their condition, and the low proportion of hypertensive individuals that, despite receiving treatment, do not have controlled BP.

These results highlight the need to develop innovative promotion strategies at individual and population levels to increase the awareness of the importance of knowing one's BP, and the consequences of not having well-controlled hypertension. The MMM17 initiative in Colombia appears to be an effective and easy to implement strategy that should be maintained in the coming years. Our findings, based on data obtained in a large number of subjects will give support to the implementation of national and effective programmes for the detection of hypertensive patients.

Supplementary material

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

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