May Measurement Month 2017: analysis of the blood pressure screening results in Ecuador—Americas

Ernesto Peñaherrera¹,²*, Maria Ramirez¹,², Ruben Peñaherrera³, Cecilia Mora¹,⁴, Yan Duarte¹,², Oscar H. Del Brutto³, Estefania Jarrin⁵, Elisa Avila⁶, Jose Ruales⁵, Juan Vintimilla¹,⁷, Fabricio Arteaga⁸, Thomas Beaney⁹, Elsa Kobeissi⁹, and Neil R. Poulter⁹

¹Sociedad Ecuatoriana de Cardiología, Ecuador; ²Hospital Luis Vernaza-Guayaquil, Guayaquil, Ecuador; ³Universidad de Especialidades Espíritu Santo-Guayaquil, Guayaquil, Ecuador; ⁴Hospital Militar, Guayaquil, Ecuador; ⁵Departamento Médico Municipio de Quito, Quito-Ecuador; ⁶Universidad de Especialidades Espíritu Santo-Guayaquil, Guayaquil, Ecuador; ⁷Unidad Cardiológica Cuenca; ⁸Universidad de Milagro, Milagro-Ecuador; and ⁹Imperial Clinical Trials Unit, Imperial College London, Stadium House, 68 Wood Lane, London W12 7RH, UK

Elevated blood pressure (BP) is a growing burden worldwide, leading to over 10 million deaths each year. Previous hypertension surveys in Ecuador, showed that there was a prevalence of 28% of adults with hypertension in 1999, 53% in adults between 60 and 75 years in 2010, and 9.3% in people between 18 and 59 years in 2012 [Freire WB, Ramírez-Luzuriaga MJ, Belmont P, Mendieta MJ, Silva-Jaramillo MK, Romero N, Säenz K, Pineiros P, Gómez LF, Monge R. Tomo I: Encuesta Nacional de Salud y Nutrición de la población ecuatoriana de cero a 59 años. ENSANUT-ECU 2012. Ministerio de Salud Pública/Instituto Nacional de Estadísticas y Censos. Quito-Ecuador 2014]. The May Measurement Month (MMM) is a global initiative aimed at raising awareness of high BP that can temporarily address the lack of screening programmes worldwide. Verbal informed consent was obtained from respondents. We enrolled 16 sites for the measurement of arterial BP and completion of the MMM17 questionnaire, the most important sites being: Guayaquil, Quito, Cuenca, Milagro, Esmeraldas, Duran, Naranjito, and Machala. We administered the MMM17 survey on 6984 people, of which 50.5% of them were men and 48.4% were women. Mean age was 46.62±17.71 SD. The crude mean BP was 115/74 mmHg. Of the 6984 people who completed the survey, we had 1522 that were already taking anti-hypertensive treatment. The number of people with hypertension (≥140 or ≥90 or on treatment for hypertension) was 1968/6982 (28.2%) persons. The number of people with hypertension of those not receiving treatment was 446/5460 (8.2%) and the number of people receiving treatment but with controlled and uncontrolled BP was 1136/1522 (74.6%) and 386/1522 (25.4%), respectively. MMM17 was the largest BP screening campaign undertaken in Ecuador. We identified 446 people with hypertension that were not receiving any treatment and 386 people with uncontrolled hypertension. These results suggest that opportunistic screening can identify significant numbers with raised BP.

*Corresponding author. Tel: +593 99826 8923; Email: epenah@yahoo.com

Published on behalf of the European Society of Cardiology. © The Author(s) 2019. This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (http://creativecommons.org/licenses/by-nc/4.0/), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact journals.permissions@oup.com
Background

Previous data from surveys on arterial hypertension prevalence in Ecuador, like the PREHTAE study, conducted in 1999, showed a prevalence of 28% arterial hypertension in adults in the country. Also, the SABE survey, conducted in 2010 revealed a prevalence of arterial hypertension of 46% in adults between 60 and 75 years. More recently, the biggest Ecuadorian survey of prevalence in the country, called ENSANUT, found a prevalence of 9.3% in people between 18 and 59 years.

Cardiovascular morbidity and mortality statistics in this country according to INEC (Instituto Ecuatoriano de Estadísticas y Censos) revealed a 27% rate of total cardiovascular mortality, 10.1% of ischaemic cardiomyopathy. In 2016, 9% of death was because of coronary heart disease in women, and 6.1% of death because of hypertensive diseases, and 7% due to cerebrovascular diseases.

Methods

The study co-ordinator for the country of Ecuador is Dr Ernesto Pena Herrera. Verbal informed consent was obtained from respondents.

We enrolled people from 16 sites for the measurement of arterial blood pressure (BP), and the May Measurement Month 2017 (MMM17) questionnaire. Most relevant sites were located at Guayaquil, Quito, Cuenca, Milagro, Esmeraldas, Duran, Naranjito, and Machala.

The study involved a total of 140 trained field personnel for BP measurements. We used our own funds and recruiting methods included media, flyers, posters, radio campaigns, and hypertension day interviews over 90 days.

The OMRON 7120 BP monitor was used for the purposes of this study. In brief, three measurements were obtained with an interval of 1 min between them while the patient was sitting for 5 min before the 1st measurement. Other parameters, such as weight and height were not measured, but the data were administered verbally by the interviewee. Hypertension was defined as systolic ≥140 or diastolic ≥90 or on treatment for hypertension.

Data collection was made by Word-MS and transcribed to Excel tables. Data were locally cleaned by Dr Ernesto Pena Herrera. Data were analysed centrally by the MMM project team.

Results

We administered the MMM17 survey to 6984 individuals (50.5% men). The mean age was 46.62 ± 17.71 years. Crude mean values of BP was 115/74 mmHg.

Of the 6984 people who completed the survey, 1522 (21.8%) were already taking anti-hypertensive drugs. According to visual inspection and patient self-report, race/ethnicity of included participants were: White (n = 42), Black (n = 60), South Asian (n = 2), East Asian (n = 3), Arabs (n = 6), Hispanics (n = 3), Mixed (n = 5617), other races (n = 1005), and unknown (n = 246). As noticed, most of the enrolled population were mixed (a mixture of Amerindians and Spaniards), representing 80.4% of the sample.

The number of individuals with hypertension was 1968, which was 28.2% of the 6982 people with a mean reading available.

The number of people with hypertension of those not receiving treatment was 446/5460 (8.2%) and the number of people receiving treatment but with controlled and uncontrolled BP was 1136/1522 (74.6%) and 386/1522 (25.4%), respectively. Individuals who have a BMI >30 in relation to people with normal weight causes SBP/DBP values to increase by 6.2/1.5 mmHg respectively and diabetic patients have SBP/DBP increased by 8.8/6.6 mmHg with regarding the patient without diabetes.

Discussion

The paramedical volunteers measured the BP under standard procedure. It is the first registry in Ecuador of Arterial Pressure Measurement with validated and calibrated devices and under approved protocols.

Data presented also allowed the analysis of the effect on the BP of other risk factors such as diabetes mellitus or obesity and smoking. Having a body mass index greater than 30 kg/m² was associated with systolic and diastolic BP levels increasing by 8.8 and 6.6 mmHg, respectively. Also, being diabetic was associated with increased systolic and diastolic BP levels of 6.2 and 1.5 mmHg, respectively.

It is noteworthy that the number of patients who have elevated BP values among those not receiving anti-hypertensive treatment was 8.2%. Furthermore, the percentage of people who take anti-hypertensive medications, and who did not have an adequate control of their BP was 25.3%.

BP surveys are important to open new venues for volunteers, medical students, nurses, Rotarians, and Lyon clubs. These will also reinforce the importance of reliable BP determination that will avoid over- or misdiagnosis in the general population. It is advisable to continue this type of screening to include a greater number of measurements and thus have reliable values of BP. The population of African-Americans included was very small being less than 1%. However, it is advisable that we have greater coverage of this population which is vulnerable to the consequences of raised BP.

Acknowledgements

Thanks to all the volunteers who made it possible for MMM17 to be a success in Ecuador. We greatly appreciate the participation of: España Germania, Cabezas Javier, Navarrete Stephany, Esteban Davila, Catalina Carvajal, Titaian Amaguaña, Mercedes Alarcon, Adriana Quilca, Andrea Perez, Cristian Castillo, Angelica Maldonado, Anahy Ordóniz, Marlon Romero, Alejandra Romero, Evelyn Caiche, Andrea Calero, Ginger Padilla, Dagmar Freres, Carlos Naranjo, Katherine Navarrete, Jenny Vera, Franklin Pincay, Bella Macias, Ana Caicedo, Maria Benalcazar, Maria Navarrete, and Luiggi Mora.

Conflict of interest: none declared.
References


