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May Measurement Month 2019: an analysis of blood pressure screening results in the Philippines

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The Philippine Society of Hypertension (PSH) took part again in the annual May Measurement Month 2019 (MMM19) blood pressure (BP) measurement campaign to raise awareness of hypertension especially in those who are not aware of their condition. The MMM19 standard protocol designed by the International Society of Hypertension was used during screening. These included the collection of basic data on demography, lifestyle, and environmental factors. Standardized sitting BP measurements were taken two to three times, using an automated BP apparatus and were inputted either in the MMM19 app or data were recorded in paper form and manually transferred to Excel spreadsheets by encoders supervised by the PSH. A total of 89 941 participated through opportunistic convenience sampling. After multiple imputation, a total of 47 925 (53.3%) participants had hypertension ($\geq$140/90 mmHg or on antihypertensive medication). Of this number, 31 151 (65%) were aware that they had high BP and 30 120 (62.8%) were on antihypertensive medications. Of the 30 120 participants on antihypertensive medications, only 18 373 (61.1%) had controlled BP

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(<140/90 mmHg). Being overweight or obese were significant predictors of high BP. Other predictors of high systolic BP and diastolic BP were alcohol intake, smoking, and a previous history of hypertension in pregnancy, while pregnant participants had significantly lower BP. The MMM19 campaign succeeded in raising awareness of high BP in our country, and the opportunistic sampling enhanced a sense of people empowerment by their knowing how easy it is to detect high BP and thereby enabling the prevention of long-term health complications. The higher BP control in the MMM19 hypertensive individuals possibly attests to the success of the previous MMM17 and MMM18 campaigns.

Introduction

The national surveys conducted by the Food and Nutrition Research Institute in the last 2 years showed a decrease in the prevalence of hypertension to 19.2% (2018) and 17.5% (2019).[1] This is a welcome development as hypertension remains to be a major risk factor for cardiovascular disease and stroke.[2] The stroke death rate in the Philippines is one of the highest in South East Asia at 13.9% out of 130.85/100 000 total death rate.[3]

The Philippine Society of Hypertension (PSH) led the May Measurement Month 2019 (MMM19) nationwide campaign in raising awareness of hypertension following the successful MMM17 and MMM18 campaigns it led in cooperation with the International Society of Hypertension (ISH). The key findings in the Philippines MMM18 showed that of 177 176 individuals screened, 39% were found to be hypertensive. Half of them were aware that they had hypertension (50.3%) and 49.9% were on antihypertensive medications. Only 28.9% of all participants with hypertension had controlled blood pressure (BP) (<140/90 mmHg).[4]

Methods

The MMM19 campaign started with kick-off ceremonies at the Manila City Hall, which were attended by local government officers and volunteers who formed part of the screeners. In different provinces and cities, the PSH local chapters, government and non-government organizations, and pharmaceutical companies helped organize the MMM19 screening activities. The ethics approval obtained in the MMM18 project was valid to be used in the MMM19 project. All screening activities were performed after obtaining informed consent. The MMM19 screening was carried out in different sites such as government and private ambulatory outpatient hospital clinics, pharmacies, market places, malls, churches, schools, work places, medical missions, and other community activities.

A total of 18 dedicated volunteer investigators with a total number of 91 sites in various parts of the country used the approved MMM19 protocol designed by the ISH. The MMM19 local campaign organizers helped orient the volunteer investigators via lecture forums, face-to-face teachings, and video recordings on how to carry out the opportunistic BP screenings in various ways from May to July 2019. Recruitment of screenees was made through public health messages in local news publications, television, and radio guest appearances by the MMM19 organizers; and announcements of activities in various places like malls, market places, hospitals, and private clinics.

As in MMM17 and MMM18, validated Omron digital BP digital devices were provided at all sites. Some also used aneroid sphygmomanometers as well. Two to three BP readings were obtained for each participant in the sitting position following standardized recommendation for obtaining BP measurements. Hypertension was defined as a systolic BP ≥140 mmHg or a diastolic BP ≥90 mmHg based on the mean of the 2nd and 3rd BP readings, or on antihypertensive medication. Data were either recorded directly to the MMM19 app or manually in paper printed protocols. The final cleaning and analysis of data submitted were carried out by the MMM19 central statistical team. For those participants missing either the 2nd or 3rd BP measurement (or both), multiple imputation using chained equations was used to estimate the missing reading based on global data, to provide better comparison across all participants.[5]

Results

A total of 89 941 individuals participated with consent in the opportunistic BP screenings in various parts of the country. Out of the total participants, 47 925 (53.3%) had hypertension. The mean age of the participants was 44.6 years (SD: ±15.8), 53.3% were females (47 971) and 46.5% were males (41 826). In terms of ethnicity, the majority were South East Asians comprising 86 689 (96.4%), 1585 were South Asian (1.8%), and 1273 (1.4%) were East Asians. A total of 84 538 (94%) were new participants in any MMM BP screening and 5165 (5.7%) previously participated in either MMM17 or MMM18. A total of 12 881 (14.3%) had their BP measured more than 12 months ago and 1270 individuals (1.4%) had never had their BP measured. There were 9.0% (8127) diabetic patients, 3.5% (3128) reported having a previous myocardial infarction, and 1.5% (1377) reported having a previous stroke. In total, 9839(10.9%) were current smokers while 79 642 (88.5%) were non-smokers. About 11 666 (13%) participants were taking statins. Among all participants, 20 142 were overweight (22.4%) and 11 585 (12.9%) were obese whilst 43 217 (48.1%) were of healthy or normal weight.

After multiple imputation, 47 925 (53.3%) were found to be hypertensive out of the total 89 941 participants. Only 31 168 (65.0%) of those with hypertension were aware they

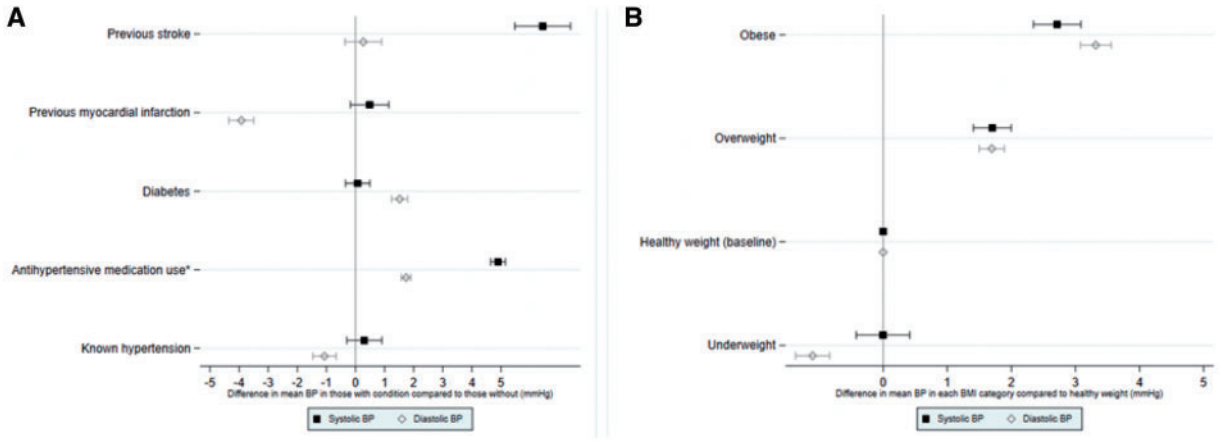

Figure 1 (*A*) Differences in mean blood pressures in those with each condition such as previous stroke, myocardial infarction, hypertension, and antihypertensive medications compared with those without these conditions. (*B*) Differences in mean blood pressures according to body mass index (BMI) with healthy weight as the reference.

were hypertensive and 30 120 (62.8%) were taking antihypertensive medication. Of individuals not taking antihypertensive medication, 17 805 (29.8%) were found to have hypertension. Of those on antihypertensive medications, 11 706 (38.9%) had uncontrolled BP and 61.1% had controlled BP (<140/90 mmHg). Of the total 47 925 with hypertension, 38.4% had controlled BP.

Based on multivariable linear regression models, systolic and diastolic BPs were significantly higher among those with previous stroke and those receiving antihypertensive medications (*Figure 1A*). Differences in mean BP according to body mass index category showed significantly higher BPs in the overweight and obese compared with those of healthy weight (*Figure 1B*). Alcohol intake was also a significant predictor of higher systolic BP both among those taking one or more drinks per week and those who take one to three drinks of alcohol per month, as compared with those who do not drink alcohol or drink alcohol rarely.

Discussion

The result of the MMM19 through opportunistic BP screening across the nation showed more than half of the participants screened (53%) were hypertensive and 65% of those with HTN were aware of their condition. Only 63% were on antihypertensive medications. Among those on antihypertensive medications, 61% had controlled BP. Of the total participants with hypertension, only 38% had controlled BP. This implies that there is a need to intensify screening programmes to diagnose more patients as well as develop educational programmes especially among the high-risk groups to increase the overall control rates. It was noted that patients with a previous stroke and those receiving antihypertensive medications still had a higher BP, which may have contributed to the low control rate. These patients need to be referred back to their physicians for aggressive BP control.

The impact of MMM campaigns since 2017 has partly contributed in hypertension awareness and lifestyle and behavioural changes as reflected in the declining hypertension prevalence in the Philippines in 2018 and 2019. Despite the limitation of being a non-random sample and therefore being not representative of the national population, the MMM19 is a pragmatic public health programme that helps increase awareness and treatment rates of hypertension in the country.

May Measurement Month, in its 3rd year, helped fortify hypertension screening programmes in the Philippines. It is cost-effective to conduct with the active participation of dedicated organizers and volunteers. This is especially true in low- to middle-income countries with limited resources to do regular monitoring and surveillance. Based on other national surveys, a decreasing prevalence of hypertension in the country is noted. The PSH hopes that this decreasing trend will be sustained with concerted public awareness programmes including the annual MMM BP screening campaigns.

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Conflict of interest: A.F.D.: Member of Advisory Board or Speaker Bureau of the following: Novartis, Sanofi, Eli

Lilly, Bayer, Menarini, Cathay YSS, Medichem, Lundbeck, Everpharma, Pascual Pharma, and One Pharma.

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