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May Measurement Month 2018: an analysis of blood pressure screening results from Malaysia

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Hypertension continues to be the top global killer, contributing to over 10 million deaths annually. As prevalence and unawareness of hypertension remain high in Malaysia, this study was aimed to screen more individuals to identify those with undiagnosed hypertension. Respondents aged ≥ 18 years were recruited through opportunistic sampling at various screening sites including health clinics, hospitals, student health centres, universities, community halls, shopping malls, as well as through other health screening campaigns. Each respondent completed a questionnaire on socio-demographic, environmental, and lifestyle data. Anthropometric measurements as well as three blood pressure (BP) measurements were obtained from all participants. Hypertension was defined as a systolic BP ≥ 140 mmHg and/or diastolic BP ≥ 90 mmHg or taking antihypertensive medication. The total number of participants was 4866. The mean age of the participants was 39.8 (17.6) years with 61.1% female participants. Of the 4866 participants, 1405 (28.9%) had hypertension. The proportion of those aware of their hypertension status was 76.3% (1073/1405). The proportion of those with hypertension on medication was 71% (998/1405). Of

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those receiving antihypertensive treatment, 62.4% (623/998) had controlled BP. The proportion of hypertension in this study was 28.9%. The awareness rate of 76.3% compares favourably to a previously reported national level of 43.2%. Hence, BP screening programmes may be effective at increasing awareness and should be conducted annually.

Introduction

The prevalence of hypertension among adults aged 18 and above in the latest National Health and Morbidity Survey (NHMS) in Malaysia in 2015 was 35.3%.¹ This showed an increase from 33.6% found 5 years earlier.¹ In 2017, the main cause of mortality in Malaysia was cardiovascular disease (CVD) accounting for 21% of total deaths in which ischaemic heart disease contributed 13.9% followed by stroke, with 7.1%.² The latest data from the Malaysian National Stroke Registry (NSR) found that more than three-quarters of patients with stroke had hypertension as its main risk factor.³ A study from China reported a large number of Chinese patients with hypertension (15.9%) were unaware of their hypertension status until they had the stroke.⁴ Thus, blood pressure (BP) screening plays an important role in increasing awareness, and subsequent treatment and control of hypertension.

In 2017, the International Society of Hypertension, extending the concept of the World Hypertension Day, initiated a world-wide BP screening campaign called May Measurement Month 2017 (MMM17). Malaysia participated in this campaign and has continued to do so since then. Results from the MMM17 campaign in Malaysia showed the proportion of participants with hypertension was 32.4%, fairly similar to that of the 2011 national survey of 33.6%.^{1,5} In MMM17, we also found that nearly two-thirds (63.9%) were on treatment and 59.5% individuals with treated hypertension had achieved BP control.⁵

As hypertension remains an important cause of CVD, and in view of many participants still being unaware of their elevated BP status, the aim of this BP screening campaign in Malaysia was to detect more undiagnosed hypertension and at the same time increase the awareness about screening for hypertension.

Methods

The screening of BP in Malaysia was led by Dr Yook Chin Chia, the then President of the Malaysian Society of Hypertension, assisted by Dr Siew Mooi Ching and Dr Navin Kumar Devaraj. Screening was conducted from 1 May to 30 July 2018 at 22 sites, namely health clinics, hospitals, universities, student health centres, community halls, shopping malls, as well as screening done during health runs in Peninsular Malaysia and two other sites in East Malaysia. Twenty-five investigators were briefed on the use of a standardized protocol.

A questionnaire was used to collect socio-demographic, environmental, and lifestyle data. Both weight and height

were measured. Seated BP was measured three times using automated BP devices (Microlife-BP-A2 Basic, Omron JPN1, Omron HEM-7121, Omron HBP-1300, Beurer BM28) following a standard procedure of BP measurement. Hypertension is defined as systolic BP ≥ 140 mmHg and/or diastolic BP ≥ 90 mmHg or on treatment for hypertension.⁶ Data were analysed centrally by the May Measurement Month 2018 (MMM18) project team and multiple imputation was performed for missing BP data based on the global data.⁶ Ethics approval was obtained from the National Medical Research Register (NMRR-18-876-40691), University of Malaya and Sunway University Ethical Boards.

Results

The total number of individuals screened was 4866. The mean age of the participants was 39.8 (± 17.6) years with 61.2% being female participants (2978/4858). The majority of the participants were South-East Asians comprising of a multi-ethnic group of Malay, Chinese, and Indians ($n = 4023/4845$, 83.0%). The majority of the participants (91.5%, 4451/4866) had three BP readings. The mean of the 1st and 2nd BP readings was 121.7/75.4 mmHg. The mean of the 2nd and 3rd BP readings was 119.9/74.3 mmHg.

After multiple imputation, of the 4866 participants, 1405 (28.9%) had hypertension. The proportion of those aware of their hypertension status was 76.3% (1073/1405). Overall the proportion of hypertensives on medication was 71.0% (998/1405) but was 93% (998/1073) amongst those aware of their hypertension status. Of those on antihypertensive medication, 62.4% (623/998) had controlled BP.

Interestingly, the systolic BP was 1.97 mmHg lower when measured on the left arm, compared to measurement on the right arm [95% confidence interval (CI) -2.89 to -1.05 , $P < 0.0001$]. However, there was no difference seen in the diastolic BP measurement. Both systolic and diastolic BPs were significantly lower in pregnant women as compared to non-pregnant women (-6.34 mmHg, 95% CI -10.59 to -2.08 , $P = 0.004$; -4.02 mmHg, 95% CI -6.98 to -1.05 , $P = 0.008$, respectively).

Discussion

This screening campaign found that 28.9% of participants had hypertension. This figure is lower than the 32.4% found in MMM17,⁵ which could be due in part to an older average age in participants from the year 2017 (mean age 45.4 ± 18.5 years), while in this current study, the mean age was 39.8 ± 17.6 years. The lower prevalence could also be due to the fact that more participants for this year's

screening were recruited from non-healthcare facilities such as universities, shopping malls, as well as during other health campaigns.

In this study, the proportion of hypertensives aware of having hypertension was 76.3%. This is higher than that found in the National Health and Morbidity Survey (NHMS) 2015 of 43.2%.⁷ Differences in the findings can stem from the fact that this study was using a non-randomized sample as compared to the NHMS 2015. Another possible reason could be that there is a likelihood of selection bias as those who are more health conscious or concerned about their health will be more likely to join this study and therefore contribute to the higher awareness figures as noted in our study. It could also be a result of the public education being carried out on a regular basis over the past few years. Hence public education about regular screening of BP still needs to be emphasized and conducted.

In terms of treatment, the majority of those aware of having hypertension were receiving treatment (93.0%). This indicates that once an individual is identified as hypertensive, they would very likely receive treatment. This is possible because Malaysia is very fortunate in that its public health care is easily accessible and free. The proportion of treated hypertensives with controlled BP was 62.4% which is almost similar to last year findings of 59.5%.⁵ As around 70% of our participants were recruited at health care facilities, it is very likely they would have been receiving treatment already, hence contributing to the higher control rate seen in our current study.

In conclusion, about 3 in 10 adults in our study have hypertension. The awareness (76.3%) and treatment rate amongst the aware (93.0%) are high. More than two-thirds of those who were on an antihypertensive agent had their BP controlled. Nevertheless, screening to increase awareness further and achieving higher control rates is still very important as it is well-established that treatment of hypertension reduces cardiovascular morbidity and mortality.

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