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May Measurement Month 2017 blood pressure screening: findings from Malaysia—South-East Asia and Australasia

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Elevated blood pressure (BP) is a growing burden worldwide, leading to over 10 million deaths each year. However there are still many individuals, particularly in many countries in Asia, who have poor BP control. In Malaysia, less than two-fifths have achieved BP control. We participated in BP screening in Malaysia in conjunction with the May Measurement Month 2017 (MMM17), a global initiative by the International Society of Hypertension (ISH) aimed at screening more individuals for earlier detection of hypertension. A nationwide screening of adults aged ≥ 18 was carried out through health campaigns at clinics, hospitals, during family day events, and charity runs from 1 April 2017 to 31 May 2017 in 42 centres. We used the detailed protocol provided by ISH for data collection. A total of 4116 individuals were screened during MMM17. After multiple imputation, 32.4% ($n = 1317/4059$) had hypertension. Out of this, 63.9% (842/1317) of those with hypertension were on treatment. Of individuals receiving antihypertensive medication with an imputed BP, 59.5% ($n = 496/834$) of them had controlled BP. MMM17 was the largest organized BP screening campaign undertaken by health professionals in Malaysia. This study identified that 32.4% of screened individuals had hypertension and 59.5% individuals with treated hypertension had achieved BP control.

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Background

Worldwide prevalence of hypertension is high and individual blood pressure (BP) control is still low particularly in many Asian countries.¹ In Malaysia, the prevalence of hypertension in adults aged 18 years and older in 2015 was 30.3% (95% CI: 29.3–31.2).² However, the level of BP control continued to be less than 40% for more than 10 years now where in 2006, the BP control was 27.5% and 37.4% in 2015.^{2,3}

The Malaysian Society of Hypertension (MSH), together with University Malaya, has been screening BP annually in conjunction with World Hypertension Day (WHD) for a number of years. The level of undiagnosed hypertension still remains very high in the local setting. Many strategies have been used, one of which is screening programmes to reduce this level of undiagnosed hypertensives. The aim of May Measurement Month 2017 (MMM17), an initiative of the International Society of Hypertension (ISH), was to screen the BP of as many people as possible throughout the world. Here, we report the data of the public BP screening done in Malaysia.

Methods

We were approached by the ISH to participate in a worldwide BP screening campaign in conjunction with WHD which falls on 17th May each year. The theme of WHD in 2017 was 'Know your Number'. A detailed protocol, essential training material, videos, and marketing information were sent to us using the bespoke MMM website.⁴ In Malaysia, a research team led by the national leader and two other members co-ordinated the campaign. Ethics approval from both the institutional ethics review board of the University of Malaya Medical Centre (UMMC) and the National Medical Research Registry was obtained on behalf of UMMC and all the other 41 healthcare centres nationwide that participated in MMM17.

Volunteers were briefed on the objectives of the above campaign, inclusion criteria of participants, questionnaire and template for data entry. Training on the correct technique of measuring BP was given using the videos taken from the MMM website. A nationwide screening of adults aged ≥ 18 was carried out through health campaigns at clinics, hospitals, community centres, during family day events, and charity runs from 1 April 2017 to 31 May 2017 in 42 centres. Specifically the MSH in collaboration with the Department of Primary Care Medicine, UMMC, held an exhibition including a cooking demonstration of healthy foods, provided a public educational talk and concurrently screened the BP of attendees over a period of a week. BP was measured using digital devices provided by the ISH (Omron model number HEM-7120). We also sourced from other local distributors and used RossMax model X1 and Buerer model no BM28.

For those found to have elevated BP, a note with brief advice on lifestyle modification, information about hypertension and its complications was given to them. They were further advised to consult their family physicians/other

healthcare providers to verify their elevated BP status 2 weeks after the initial screening.

During the screening campaign, we promoted healthy lifestyle changes including a low salt diet, increasing physical activities and smoking cessation. We also assessed participants' knowledge about stroke and provided advice on the appropriate measures to preventing this complication of hypertension. Very importantly, we advised those with normal BP to have their BP screened every year. For subjects who were hypertensive but had uncontrolled BP, we emphasized the importance of good BP control.

Data cleaning was performed locally before sending to ISH for further centralized data cleaning and statistical analysis. Multiple imputation for missing BP data and detailed statistical analysis was done by the MMM statisticians according to the standard protocol.⁴

Results

A total of 4116 participants were screened during this campaign. The mean age of the participants was 45.4 (SD 18.5) years and mean BMI was 25.8 (SD 4.8) kg/m². The distribution of ethnicity was Malay (49.5%, $n = 1567$), followed by Chinese (26.3%, $n = 831$), Indian (21.6%, $n = 683$), and others (2.5%, $n = 80$). About 59.1% were female. One-tenth of them reported to have underlying diabetes (10.9%) followed by having a history of previous myocardial infarction (3.3%) and stroke (1.5%). Only 5.2% reported to be a current smoker.

Of the 1178 participants with three BPs readings, systolic BPs decreased on average by 3.6 mmHg and diastolic BP also decreased by 1.9 mmHg between the 1st and 2nd readings. Meanwhile, the systolic BP decreased on average of 2.7 mmHg and the diastolic BP decreased by 1.5 mmHg between the 2nd and 3rd readings. The mean BP was 137/83 mmHg based on the mean of the 1st and 2nd readings compared with 134/82 mmHg based on the mean of the 2nd and 3rd readings.

After imputation, of the 4116 individuals for whom a mean of the 2nd and 3rd readings was available or known to be on antihypertensive treatment, 32.4% ($n = 1317/4059$) of the participants had hypertension. Of individuals not taking treatment, 14.8% ($n = 475/3217$) had hypertension, which was 36.1% (475/1317) of the total with hypertension. Of those with hypertension, 63.9% (842/1317) were on treatment. Among participants who were on treatment for hypertension and with an imputed BP, 59.5% ($n = 496/834$) of them had controlled BP.

Discussion

During MMM17, 32.4% of the participants had hypertension. This is consistent with national data which reported the prevalence of hypertension among adults aged 18 and above to be 30.3% in 2015.² Our prevalence of hypertension is still higher than the prevalence in the USA which was 29%.⁵

Of participants found to have hypertension, 63.9% were on antihypertensive treatment. This finding is lower than the national data where 78.9% to 83.2% of those with

hypertension were on treatment.³ Of those on treatment in our screening campaigns, 59.5% had controlled BP. This is a higher than the control rate of 47.3% reported in one of the studies done in Malaysia.⁶ In comparison the control rate in the USA was also lower at 48.3%.⁵ This higher level of control rates may reflect bias due to convenience sampling but could be a consequence of the repeated screening that we have been doing for the past several years at UMMC, as UMMC contributed more than half of the subjects screened this year. The repeated screening done in previous years could have served to inform individuals of their BP status thus increasing the control level of their BP. Furthermore, for the past 2-3 years, the MSH together with the Ministry of Health Malaysia have also been doing public education over the radio and print media about hypertension and the importance of annual measurement of BP by doctors and other healthcare professionals. These could have contributed to the higher level of BP control of individuals screened in our campaign. This would also suggest that screening campaigns are useful as it is shown here that the level of BP control is much higher than the other studies. However, this new finding of a higher level of BP control needs to be confirmed. Furthermore, our screening campaign was an opportunistic event and random sampling method was not applied in the participants' recruitment. Thus, we have to interpret the results of this MMM17 carefully within the context of its limitations. And if indeed the level of BP control is higher, then it would appear that screening campaigns are effective in improving BP control rates.

Conclusion

Our screening campaign reported that one-third of the participants have hypertension and this is similar to other national figures. The benefit of this screening campaign is that it had identified a higher BP control rates of individuals with hypertension. However, there is still room for further improvement to identify those who have poor BP control so that their treatment can be optimized in order

to benefit from the reduction in cardiovascular morbidity and mortality.

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