May Measurement Month 2019: an analysis of blood pressure screening results from India


Aims: May Measurement Month is a global screening campaign to raise awareness regarding elevated blood pressure (BP). With the growing burden of hypertension, it is imperative to regularly assess the disease's prevalence, risk factors, and awareness levels in a country. The current prevalence of hypertension in India as per the National Family Health Survey Data stands at 25.3%. May Measurement Month mobilizes healthcare professionals and sensitizes them to regularly measure BP, and impart lifestyle modification advice to the community. It also complements the deficiency in screening programmes at a national and international level.

Methods and results: May Measurement Month was carried out in May 2019 as an opportunistic screening campaign for adults (≥18 years). It was carried out by over 5000 trained volunteers across approximately 1000 screening sites (hospitals, public places, pharmacies, villages, and malls) in India. A total of 362 708 (57%
Introduction

The last few decades have seen an increase in the prevalence of hypertension in India. Hypertension, often referred to as the ‘silent killer’, is known to cause various complications such as stroke, retinopathy, ischaemic heart disease, aneurysms, and renal disease. A staggering 57.0% of stroke and 24.0% of coronary artery related deaths have been attributed to hypertension. Over the past five decades, researchers have established hypertension as a consistent and resilient risk factor that doubles the mortality and mortality burden with an increase of systolic blood pressure (BP) level of 20 mmHg. Nearly, 10.8% of all deaths in India and 28.0% of mortality due to cardiovascular diseases are attributed to hypertension.

The May Measurement Month (MWM) initiative, conceptualized by the International Society of Hypertension, is a stride in the right direction towards improving awareness regarding this silent killer. India has been an active participant in this campaign since 2017. In 2017, 31.8% of the total participants (240,376) were found to be hypertensive based on all three BP readings, whereas 14.0% (n=122,685) were on antihypertensive treatment. This campaign in 2018 saw a similar prevalence of hypertension at 32.3% (n=345,234).

Awareness regarding hypertension, its prevention, and control is low in the community leading to poorly managed BP levels. Identifying hypertension in the community, sensitizing the population towards the regular measurement of BP, and improving medication compliance is crucial for managing and controlling hypertension.

Methods

Multiple study coordinators led the MWM campaign in India and were responsible for training the volunteers in BP measurement techniques and disseminating lifestyle guidance. May Measurement Month 2019 India was conducted in over 1000 sites with more than 5000 volunteers [doctors, nurses, dieticians, allied health care professionals, Anganwadi workers (ANM), pharmacists, doctors in training, and students]. The ethical clearances were taken at the local screening sites by the respective site coordinators and informed consent was taken from each respondent. The MWM campaign involved a volunteer drive by various national organizations and associations (Public Health Foundation of India, Indian Society of Hypertension, Indian Association for Parenteral and Enteral Nutrition, and Rural Health Progress Trust), social media campaigns, and educational institutes. The screening was conducted in public places such as malls, metro stations, villages, offices, housing complexes, religious homes (temples, churches, etc.), pharmacies, clinics, and hospitals, using a mercury sphygmomanometer or a digital BP machine. The site coordinators obtained ethical clearance for the screening sites. The screening for BP continued through May (1st May to 31st May 2019) and was extended to 31st July 2019. Data were collected on Microsoft Excel sheets and an app developed by ISH. The MWM project team at ISH collated, cleaned, and analysed the data.

Blood pressure was recorded three times in the seated position by the volunteers, while height and weight were either self-reported or measured at the screening site. Multiple imputations were used to calculate the mean of second and third readings where the measurements were missing, based on the global data. Hypertension was defined as a systolic BP ≥ 140 mmHg or a diastolic BP ≥ 90 mmHg or on hypertension treatment. May Measurement Month 2019 captured data that were not collected in previous years, including number of antihypertensive drug classes being consumed, location of screening site, use of aspirin or statin, and if the participants were fasting.

Results

Of the total 362,708 participants screened, 92.5% were of South Asian ethnicity. The population had a mean age of 43.4 (SD: ±16.0) years, 57.0% were males, and 2.6% of women were pregnant at the time of screening. The BP screenings took place mostly in public areas (47.6%) and hospitals or clinics. Over two-thirds of the participants (247,057 (68.1%)) had their BP measured for the first time ever. About one-tenth of the participants (11.3%) were previously diagnosed with diabetes, 6.0% had a history of myocardial infarction and 5.1% of stroke. Aspirin and statin consumption was reported in 5.9% and 7.2% of participants, respectively. A large majority of the participants did not report consuming alcohol (91.4%) or smoking (81.1%), and 6.6% of them were fasting. The mean body mass index of participants was 24.5 (SD: ±4.9) kg/m².

After imputation, 29.4% (106,522) of respondents were hypertensive; of these, 46,646 (43.8%) were aware of being...
hypertensive, and 44,710 (42.0%) were on antihypertensive treatment. A total of 24,795 hypertensive patients (23.3%) of all hypertensive participants had controlled BP (systolic BP \(< 140\) mmHg and diastolic BP \(< 90\) mmHg), while BP was uncontrolled in 19,915 (44.5%) of those on BP-lowering medications (\(n = 44,710\)).

For respondents with three BP readings (\(n = 295,517\)), the mean of second and third readings (126.0/79.1 mmHg) was similar to the mean of all three measurements (126.6/79.4 mmHg). The age and sex standardized mean BP for those on antihypertensive medication was 135.5/82.5 mmHg and 123.9/78.1 mmHg in those not on treatment. Excluding those on treatment, systolic BP was seen rising with age in women while in men it peaked around 65 years of age, followed by a small decline. The diastolic BP showed lesser variability but similar trends as systolic BP. Linear regression models adjusted for age, sex and, use of antihypertensive drugs showed that the mean BP was significantly higher in known cases of diabetes and hypertension, and people on BP-lowering medications (adjusted for age and sex alone), while it was lower for those with previous myocardial infarction and stroke. Compared to readings taken in a hospital or clinic, linear regression models for the difference in mean BP at each screening site type showed significantly lower systolic and diastolic BP levels when taken in indoor public spaces, but systolic BP readings were higher in outdoor public spaces, in workplaces and pharmacies. There is a significant increase in both systolic BP and diastolic BP in those drinking alcohol one or more times per week compared to never drinking (Figure 1).

Discussion

With a third of the screened population (\(n = 362,708\)) being hypertensive and less than half of them aware of being hypertensive, MMM has proven to be an important initiative towards the detection of raised BP. The proportion of hypertension in MMM19 (29.4%) has not been much different than what was reported in MMM17 (31.2%) and MMM18 (32.3%), as well as the global MMM 2017\(^3\) and 2018\(^4\) data (34.9% and 33.4%, respectively). Of the 42% of participants that were on BP-lowering drugs, 45% had uncontrolled BP, which is higher than the 40.1% seen globally.\(^7\) These results point to the need for enhanced BP awareness efforts, establishing standardized BP management strategies, and addressing the burden of risk factors of hypertension, including obesity, alcohol intake, and medication compliance.

May Measurement Month limitations include assessment of BP in a single instance, thus increasing the chances of inaccurate diagnosis. May Measurement Month in India was an opportunistic screening; therefore, the sampling was not random and not representative of India’s population. Moreover, the efficacy of lifestyle advice given to the participants could not be evaluated in this study.

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References


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