

May Measurement Month (MMM) 2017: an analysis of blood pressure screening results in Bangladesh—South Asia

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Elevated blood pressure (BP) is a growing burden worldwide, leading to over 10 million deaths each year. Based on the findings of the non-communicable disease Risk Factors Survey Bangladesh 2010, the prevalence of hypertension in adults 25 years or older in Bangladesh is 20.1%. The Bangladesh Demographic Health Survey, 2011 showed that approximately 50% of those affected are unaware of their hypertensive condition. The May Measurement Month 2017 (MMM17) is a global initiative of the International Society of Hypertension (ISH) aimed at raising awareness of high BP. We participated in MMM17 to raise awareness of hypertension screening and identify those with elevated BP who were unaware, and those on treatment with still uncontrolled hypertension. Following the standard protocol designed by the ISH, we participated in MMM17, an opportunistic cross-sectional survey of volunteers aged ≥ 18 . It was carried out in May 2017. BP measurement, the definition of hypertension and statistical analysis followed the standard MMM protocol. Data were collected from 35 screening sites in 33 districts in Bangladesh. Personnel from several government and non-government organizations volunteered in this huge event. A total of 11 418 individuals were screened during MMM17, of which 5401 (47.3%) were found to have hypertension. Of 8365 individuals not receiving anti-hypertensive medication, 2348 (28.1%) were hypertensive. Of 3053 individuals receiving anti-hypertensive medication, 1594 (52.2%) had uncontrolled BP. MMM17 was the largest BP screening campaign undertaken in Bangladesh. This study suggests that opportunistic screening can identify significant numbers of people with raised BP. A periodic public health programme at a national level needs to be initiated to increase hypertension detection and control rate and thus for the prevention of cardiovascular diseases.

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Introduction

Cardiovascular disease has become the top cause of death in Bangladesh.¹ Raised blood pressure (BP) is one of the largest contributing risk factors to death and the burden of disease in Bangladesh.² According to non-communicable disease (NCD) Risk Factors Survey Bangladesh 2010, about one-fifth (20.1%) of adults aged 25 years or more have hypertension in Bangladesh.³ The Bangladesh Demographic Health Survey, 2011 showed that approximately 50% of those affected are unaware of their hypertension.⁴ There is no national level programme for regular screening of hypertension in Bangladesh except occasional screening camps organized by government agencies and non-government organizations. Measurement of BP is a cheap, simple, and non-invasive technique to detect hypertension and, assuming effective therapy is supplied, leads to highly cost-effective protection against death and disability.⁵ However, the NCD risk factor survey reported that almost one-third of the adult population (Men 44%, Women 22.8%, Overall 32.9%) did not have their BP measured in their lifetime in Bangladesh.⁶

The National Heart Foundation of Bangladesh (NHFB), a non-profit organization, has been conducting hypertension screening by organizing heart camps in various parts of Bangladesh. It is a member of the International Society of Hypertension (ISH) and World Hypertensive League (WHL), and it took part in the May Measurement Month 2017 (MMM17), a global cross-sectional BP survey of adults 18 years old or older. The NHFB, in collaboration with Non-Communicable Disease Control Programme of Directorate General of Health Services (NCDC-DGHS), Ministry of Health and Family Welfare Government of Bangladesh, co-ordinated the nationwide hypertension screening programme in the month of May 2017. The primary objective was to raise awareness about BP, document the number of people screened, and the number of people who have untreated or inadequately treated hypertension.

Methods

The nationwide survey for detection of high BP among adult was conducted in 35 screening sites in 33 districts of Bangladesh following the protocol developed by the ISH. Twelve investigators from the NHFB Hypertension Committee and NCDC-DGHS co-ordinated the screening

campaign. Both public and private sector healthcare facilities were used for setting up the screening sites. About 100 volunteers (mostly physicians, nurses, and paramedics trained in BP measurement) were given the task of conducting screening programmes in hospital vicinities as well as in community settings. An administrative order was issued by NCDC-DGHS for organizing a screening programme at government hospital vicinities during the week of World Hypertension Day (17 May). Personnel from several pharmaceutical companies provided logistic support. Data were collected in a pre-designed questionnaire, targeting volunteer adults (aged ≥ 18 years) who have not had their BPs measured for at least a year. Each participant had their BP, height, and weight measured and a questionnaire was administered to collect information on demographic, life-style, and environmental factors. Both manual and digital BP measuring devices were used depending on the availability of the instruments at screening sites. Incomplete questionnaires were discarded and in total 11 418 data were entered in a locally developed database and sent to the MMM project team for final analysis.

Ideally, three BP measurements were recorded, and crude analyses were done using the mean of the 2nd and 3rd BP readings, whenever available. To provide a comparable BP reading for all individuals, multiple imputations were used to estimate the average of the 2nd and 3rd readings where either reading was not documented. Mean BPs were standardized for age and sex according to the World Health Organization (WHO) world age-standard population along with an assumed sex ratio of 1:1. Hypertension was defined as either systolic BP (SBP) ≥ 140 mmHg and/or diastolic BP (DBP) ≥ 90 mmHg or on one or more anti-hypertensive drug. Detailed methods of the programme and analysis have been published earlier.⁷

Results

A total of 11 418 individuals (62.7% men) in 35 sites in 33 districts of Bangladesh participated in the screening programme. Mean (SD) age of the respondents was 43.3 (11.4) years. Among them 26.7% (3053) were on anti-hypertensive medication, 23.3% (2658) were diabetic, 6.2% (705) had a history of myocardial infarction, and 6.3% (719) had a history of stroke. About 8% (337) women respondents were pregnant. About 22.1% (2523) were smokers while

Table 1 Crude and age-/sex-standardized blood pressure measurements using WHO world standard populations

	Crude BP	Age- and sex-standardized BP	Age- and sex-standardized BP excluding those on treatment	Age- and sex-standardized BP in those on treatment
<i>N</i>	11 412	11 411	8359	3052
Systolic BP (mmHg)	128.2	126.8	124.6	133.9
Diastolic BP (mmHg)	83.6	82.4	81.3	85.6

BP, blood pressure.

only 1.6% (187) were alcohol drinkers. The average body mass index was 24.3 (SD 3.7) kg/m².

Mean SBP and DBP were the lowest (SBP 127.2 mmHg, DBP 82.9 mmHg) when reading 3 was considered compared with the mean of readings 1 and 2. Mean SBP and DBP of readings 1 and 2 were 130.1 and 84.9 mmHg, respectively, while the mean of readings 2 and 3 was 128.2 and 83.6 mmHg, respectively. After imputation, age- and sex-standardized mean SBP and DBP were 126.8 and 82.4 mmHg, respectively, and after excluding those on treatment, mean SBP and DBP were 124.6 and 81.3 mmHg, respectively (Table 1).

After imputation, of the 11 418 individuals for whom a mean of the 2nd and 3rd readings was available, 5401 (47.3%) individuals were hypertensive. About 2348 (28.1%) of 8365 individuals who were not on anti-hypertensive treatment were detected as hypertensive and 1594 (52.2%) of 3053 individuals who were receiving treatment but identified as having uncontrolled hypertension (Table 2).

Discussion

MMM17 is the largest hypertension screening campaign in Bangladesh done in collaboration with government and non-government organizations following a standardized protocol.

The high age-adjusted prevalence of hypertension reported in this study might be due to the fact that the participants were volunteers who for some reason were concerned about their BP. MMM17 used opportunistic screening and so findings do not necessarily accurately reflect the true prevalence of hypertension. These results conflict with a recent NCD risk factor survey which reported an age-adjusted prevalence of hypertension of 20.8% among adults in Bangladesh.³

Our study found that about 28.1% of newly detected hypertensive individuals were not on anti-hypertensive treatment and 52.2% of individuals who were receiving treatment had uncontrolled BP; identified as SBP >140 or DBP >90 mmHg. A previous study among the Bangladeshi population by Jafar *et al.*⁸ reported 52.8% uncontrolled hypertension among hypertensive patients. Mean SBP and DBP were higher among those who were on treatment than those who were not on treatment, indicating a larger number of uncontrolled hypertensives.

This study suggests that opportunistic screening can identify significant numbers of people with raised BP. A periodic public health programme at a national level needs to be initiated to increase hypertension detection and control rate, and thus, the prevention of cardiovascular diseases.

Conflict of interest: none declared.

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Table 2 Number and percentage of participants with hypertension, with hypertension and not receiving treatment, receiving treatment but with uncontrolled blood pressure

Participants with hypertension	Percentage	Denominator ^a	Participants with hypertension and not receiving treatment	Percentage	Denominator ^b	Participants receiving treatment but with uncontrolled blood pressure	Percentage	Denominator ^c
5401	47.3%	11 418	2348	28.1%	8365	1594	52.2%	3053

^aAll participants.

^bParticipants not receiving treatment.

^cParticipants receiving treatment.

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