

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

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Elevated blood pressure (BP) is a growing burden worldwide, contributing to over 10 million deaths each year. May Measurement Month (MMM) is a global initiative organized by the International Society of Hypertension aimed to raise awareness of high BP. In May 2018, we carried out an opportunistic cross-sectional survey of volunteers from different parts of the country aged ≥ 18 years. Blood pressure measurement followed the standard MMM protocol and statistical analysis mean of the last 2 of 3 readings was used, where these were unavailable additional imputations were performed. In total, 4883 individuals (61.0% female) were screened during the whole month of May in 91 primary and secondary health facilities, pharmacies and through an online survey. After multiple imputation, 2841 (58.2%) had HTN. Of individuals not receiving antihypertensive medication, 850 (29.4%) were hypertensive. Of those receiving antihypertensive medication, 1025 (51.5%) had uncontrolled BP. MMM18 was the largest BP screening campaign undertaken in Slovenia. A substantial number of people with possible HTN were identified and referred to general practitioners for further management. The high number of individuals with HTN, with newly diagnosed HTN and with uncontrolled BP despite medication, confirms a real need for such screening programmes in our country.

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Introduction

Arterial hypertension (HTN) is one of the leading modifiable risk factors accounting for cardiovascular diseases (CVDs) and kidney failure, and represents the leading cause of mortality worldwide.¹ It is responsible for over 10.4 million deaths yearly and given the population's growth and ageing, this number is expected to increase.² It has been proven that blood pressure (BP) lowering medication can prevent HTN-related cardiovascular events.³ However, despite treatment improvements, low awareness and inadequate BP control in treated patients remain.³ Therefore, the aim of May Measurement Month (MMM) is to increase awareness of the presence and dangers of HTN and improve the commitment of patients to reach their target BP goals.

Slovenia is a small country in southern Central Europe with a population of 2.08 million.⁴ Reported HTN prevalence in Slovenia in the year 2014 ranged from 24.8% to 28.0% of the whole population ≥ 18 years of age.^{5,6} For comparison, prevalence in the European countries for the same year ranged from 15% to 32%.⁵ Cardiovascular disease mortality in Slovenia represents 45.7% of all-cause mortality, which is slightly below the European average (48.9%); ischaemic heart disease (IHD) mortality contributing to 175/100 000 deaths/year in men and 86/100 000 deaths/year in women and stroke 144/100 000 deaths/year in men and 104/100 000 deaths/year in women.⁶ Cardiovascular disease morbidity rates in our country roughly follow the European average with prevalence rates of IHD 3111/100 000 in men and 1646/100 000 in women, and prevalence rate of stroke 582/100 000 in men and 579/100 000 in women.⁶ Prevention and adequate therapy of HTN, a major contributor to CVD mortality, has utmost importance to further improve still poor statistics.

Our country started with yearly free BP measurements and awareness activities across the country back in 2005 when World Hypertension Day was announced by the World Hypertension League. In recent years, we invited the Slovenian Family Medicine Society, Slovenian Chamber of Pharmacies and National Institute of Public Health to participate and expanded activities from one day to the whole month of May.

Methods

In May 2018, the cross-sectional survey MMM18 was initiated by the International Society of Hypertension (ISH).⁷ The national co-ordinators for Slovenia were Assist. Prof. Jana Brguljan Hitij and Nina Božič from Department of Hypertension, University Medical Centre Ljubljana in the frame of Slovenian Hypertension Society. All the materials provided by the ISH were translated into

Slovenian language. The study was approved by the National Ethics Committee, and all the participants gave written informed consent. We encouraged all national primary and secondary healthcare facilities and pharmacies to set up measuring sites of which 91 responded. We also set up two measurement sites in the University Medical Centre in Ljubljana. With kind support of the

pharmaceutical company krka, d.d., we distributed all the materials to participants and we launched a campaign to promote MMM18 activities in the media through radio and internet messages. We set up our own internet site with all the promotional materials and the link to online survey. On World Hypertension Day, we organized a Press Conference and our leading HTN experts appeared on radio and television broadcasts to raise BP awareness.

Following verbal consent, participants were allowed to rest 3-5 min. Meanwhile, they filled out a paper questionnaire including questions about demography, past medical history, lifestyle habits, and estimates of their weight and height. Afterwards, at least one (and up to three) seated measurements were recorded by trained staff with automated devices with 1-min interval between measurements. Blood pressure values were recorded on the paper questionnaire. Hypertension was defined as receiving BP-lowering medications or having a systolic BP ≥ 140 mmHg or diastolic BP ≥ 90 mmHg based on the mean of the 2nd and 3rd BP readings. In participants on treatment, controlled BP was defined as both systolic BP < 140 mmHg and diastolic BP < 90 mmHg. Individuals with high BP were provided with printed dietary and lifestyle advice and recommendation to visit their doctor. Paper questionnaires were entered into study-specific Excel data sheets and sent to ISH. Collected data were analysed centrally by the MMM project team and multiple imputations were performed to impute the mean of readings 2 and 3 where they were missing.⁷

Results

A total of 4883 participants were screened in Slovenia in May 2018. The mean age of all participants was 58.9 ± 15.6 years, and women represented a higher proportion than men (2978 or 61.0%). Ethnicity was exclusively white. In total, 1991 (40.8%) participants were on antihypertensive medication. Of all screened individuals, 506 (10.4%) reported having diabetes, 199 (4.1%) reported a history of myocardial infarction, and 137 (2.8%) reported a previous stroke. A total of 752 (15.4%) were current smokers and 27 (0.9%) women reported to be pregnant. The mean body mass index was 27.3 ± 4.9 kg/m², 2871 (58.8%) of all participants were overweight or obese.

After imputation, 2841 of 4883 participants (58.2%) had HTN and 78.4% were aware of their diagnosis. A total of 850 (29.4%) out of 2892 participants, who were not on antihypertensive medication, were hypertensive. Of those with HTN, 70.1% were on antihypertensive medication. Among those who were receiving treatment, 1025 (51.5%) out of 1991 had uncontrolled BP.

After imputation, the mean BP was 126.9/78.4 mmHg after standardizing for age and sex. From linear regression models, after adjustments for age and sex, significantly higher systolic BPs were seen in diabetic patients and smokers. Body mass index was also associated with higher BP, both systolic and diastolic BPs were significantly higher in overweight and obese people compared with normal weight participants. Systolic BP was significantly lower in patients with previous stroke.

Discussion

As part of MMM18, Slovenia included 4883 subjects, representing 0.23% of our country's population. More than half (58.2%) of the whole cohort (treated or untreated) had HTN. Of those identified as hypertensive only 78.4% were aware of their high BP. Among treated patients, 48.5% had controlled BP. We identified 850 subjects with the possibility of newly diagnosed HTN and 1051 patients on treatment but with inadequately controlled BP, which represents 38.9% of the whole screened cohort. This clearly demonstrates the importance of inexpensive and simple screening at a population level for primary and secondary prevention. Such campaigns help increase awareness of HTN which can lead to reduction of CVD complications. However, it should be emphasized that due to the non-randomized inclusion of participants, the collected data cannot be evaluated as representative of the Slovenian population. Also, subjects were mainly recruited in health centres and pharmacies, so they are more likely to represent individuals who have regular contact with healthcare service due to their known illnesses. Nevertheless, this is a large sample and the data obtained at least partly follow data from other European populations, despite methodological obstacles.

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