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May Measurement Month 2017: an analysis of blood pressure screening in Hungary—Europe

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Elevated blood pressure (BP) is a growing burden worldwide, leading to over 10 million deaths each year. The cardiovascular mortality rate in Hungary is twice as high as the European Union average. In a recent Hungarian screening programme, among those volunteers who claimed to be healthy, BP was above 140/90 mmHg in 24% and 39% in women and men, while the control rate was 45% and 36% in women and men, respectively. May Measurement Month (MMM) is a global initiative by the International Society of Hypertension aimed at raising awareness of high BP and to act as a temporary solution to the lack of screening programmes worldwide. An opportunistic cross-sectional survey of volunteers aged ≥18 was carried out in May 2017. BP measurement, the definition of hypertension and statistical analysis followed the standard MMM protocol. In Hungary, 97 sites were set-up in primary and secondary care facilities, in pharmacies and in malls. All regions, both cities and villages were involved. A total of 3967 individuals were screened. After multiple imputation, 2052 subjects (51.8%) had hypertension. 553 (22.4%) of untreated individuals had hypertension, and 666 (44.5%) of treated individuals had uncontrolled BP. More than 50% of the screened cohort had hypertension (treated and controlled, treated and uncontrolled or untreated). By identifying almost one-third of the screened cohort with the possibility of newly diagnosed or uncontrolled hypertension, the Hungarian part of MMM17 suggest that opportunistic screening can identify significant numbers with raised BP.

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Background

Hypertension is the leading cause of mortality and disability-adjusted life years all over the world.[1] In the USA, hypertension is at the top of the list among single risk factors accounting for cardiovascular disease (CVD) deaths and was second after smoking as a preventable cause of death for any reason.[2]

In Hungary, CVD mortality is an enormous public health problem. Among women 55%, while among men 45% of deaths were attributed to CVD in 2013.[3] Between 2000 and 2012 CVD mortality decreased by about 30% in both sexes and in both age categories of 40–59 years and 60–79 years. This was due to a reduction in a combination of ischaemic heart disease and stroke.[4] However, compared with other European Union countries Hungary is still in a bad position. In 2014, Hungary with Lithuania, Latvia, and Slovakia had one of the four highest rates of ischaemic heart disease mortality with 487/100 000 deaths/year in men and 327/100 000 deaths/year in women. In respect of cerebrovascular mortality Hungary is also in the worst quartile of the European Union countries with 174/100 000 deaths/year in men and 130/100 000 deaths/year in women.[5]

The prevention and adequate therapy of hypertension, as a major contributor to CVD mortality, has utmost importance to further improve the still poor statistics of Hungary. Based on the coding of hypertension in general practitioner practices, the number of diagnosed hypertensive patients in Hungary has grown from 2.5 million in 1999 to more than 3.5 million in 2015.[6] The Hungarian Society of Hypertension funded a national hypertension registry in 2002. Based on the recent data of 27 399 consecutive hypertensive patients evaluated in 2015, 44.9% of the patients reached the target of 140/90 mmHg, but only 9.6% had values under 130/80 mmHg.[7] So every campaign that aims at increasing hypertension awareness in our country has exceptional importance. That is why the Hungarian Society of Hypertension decided to join MMM 2017 (MMM17), the hypertension awareness campaign of the International Society of Hypertension (ISH). Hereafter, we provide the Hungarian data of MMM17.

Methods

This was a cross-sectional survey planned and distributed worldwide by the ISH. The Hungarian co-ordinator was Professor István Kiss, at that time the president of the Hungarian Society of Hypertension, who tragically died in May 2018.

Prior to participation, all patients gave written informed consent. The study was approved by the Scientific and Research Ethical Committee of the Medical Research Council, the Hungarian Ministry of Health (ETT TUKEB 25151-2/2017/EKU) and was carried out in accordance with the tenets of the Declaration of Helsinki.

The survey was carried out following the instructions of ISH.[8] Sites were set-up in primary and secondary care facilities, in pharmacies and occasionally in shopping malls. Target subjects were adult volunteers ($\geq$18 years), who had not had their blood pressure (BP) measured in the previous year. Site leader physicians and assistants were recruited and trained by the Hungarian Society of Hypertension. The campaign was promoted by scientific newsletters of the society and through the social media.

Recommendation for standard methods included the measurement of arm circumference for appropriate cuff size use; left side measurement preferably; at least 5 min resting before measurements in seated position; prohibition of smoking before and during the measurement; three consecutive measurements 1 min apart and the use of preferably validated automated oscillometric upper-arm cuff devices (device type not registered). The mean of the 2nd and the 3rd BP measurement was calculated. Hypertension was defined as a systolic BP $\geq$140 mmHg or diastolic BP $\geq$90 mmHg or taking anti-hypertensive medication.

Screening took place between the 1 and 31 May 2017 and data were collected via scanned or mailed paper sheets.

Altogether 97 sites were involved and data were collected by the headquarters of the Hungarian Society of Hypertension and without local cleaning were directly transferred to ISH. State data were analysed centrally by the MMM/ISH project team.[8] There were no sources of funding.

Results

A total of 3967 Caucasian subjects participated (mean age 50.2, SD 16.8 years). As data collection was incomplete for some of the variables in the study questionnaire, numbers vary in different analyses.

Women were represented in higher proportion than men ($n = 2365$, 59.6% and $n = 1602$, 40.4%, respectively). Mean BMI was 26.7 kg/m^2, 1110 (28%) subjects were current smokers and 255 (6.4%) reported consumption of alcohol once or more per week. A total of 1499 subjects (37.8%) were on anti-hypertensive medication, 548 (13.8%) had diabetes, 502 (12.7%) had a history of myocardial infarction and 180 (4.5%) a history of stroke. Most of the BP measurements were performed on the left arm (82.2%).

In the whole cohort the mean BP was 129.4/79.9 mmHg. After imputation and standardizing for age and gender, in those patients who did not receive anti-hypertensive medication, the mean BP was 125.7/78.6 mmHg, while in treated subjects 134.5/82.7 mmHg. The proportion of untreated normotensive subjects was 48% ($n = 1912$). The proportion of subjects not on treatment who were found to have high BP was 22.4% ($n = 553$). On the other hand, the proportion of treated patients with uncontrolled BP was 44.5% ($n = 666$).

After adjustment for age and sex, significantly higher systolic and diastolic BPs were found in subjects receiving anti-hypertensive medication (see Supplementary material online, *Figure S1*). After adjustment for age, sex, and anti-hypertensive medication systolic and diastolic BP was higher in patients who regularly take alcohol, while only systolic was higher in those with diabetes and in smokers. Increasing BMI was also associated with the elevation of both systolic and diastolic BPs (see Supplementary material online, *Figure S2*).

Discussion

As part of MMM17, the largest synchronized, standardized multinational screening campaign of any cardiovascular risk factor ever to be done all over the world, Hungary was represented with 3967 subjects involved. More than half of the whole cohort had hypertension (treated or untreated). The proportion of subjects with uncontrolled hypertension was 22.4% among untreated patients and twice as high (44.5%) among treated patients.

By identifying 1219 subjects with the possibility of newly diagnosed or uncontrolled hypertension, which was 30.7% of the whole screened cohort, the Hungarian part of MMM17 once again demonstrated the important role of screening hypertension for primary and secondary prevention, as well. Besides the direct benefit for the identified undiagnosed hypertensive patients, these data also can provide ammunition for the fight for stronger support of hypertension care at a governmental level. With an inexpensive and simple screening method such as this, followed by the proper intervention, many CVD events and deaths can be avoided.

In Hungary, since 2010 a unique national CVD screening programme has been ongoing. A specially furnished lorry is moving throughout the country, in which different examinations are carried out. Until the end of 2017, the screening truck had been to 1505 places, 135 879 people had participated in comprehensive screening and 124 557 people had relevant BP measurement, with 11 601 successful measurements in 2017.[9] In 2017, among those patients who were self-reported as healthy, BP was above 140/90 mmHg in 24.2% and 39.2% of women and men, respectively. In those with a history of hypertension it was uncontrolled in 55.2% and 63.8% in women and men, respectively. We assume that the comparison of these results or the results of the Hungarian Hypertension Registry with the Hungarian MMM17 findings is inappropriate because of the divergent screening sites of MMM17, but it is obvious, that a huge proportion of the screened people in MMM17 was found to be in the high BP range.

In conclusion, the results of MMM17 in Hungary highlight the importance and value of hypertension screening at a population level. Such campaigns can increase the awareness of hypertension which can lead to the reduction of CVD complications.

Supplementary material

Supplementary material is available at *European Heart Journal - Supplements* online.

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