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Do we know more about hypertension in Poland after the May Measurement Month 2017?— Europe

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Elevated blood pressure (BP) is a worldwide burden, leading to over 10 million deaths yearly. May Measurement Month (MMM) is a global initiative organized by the International Society of Hypertension aimed at raising awareness of hypertension and the need for BP screening. 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 globally approved MMM17 Study Protocol. In Poland 5834 (98.9%, Caucasian) individuals were screened. After multiple imputation, 2601 (35.3%) had hypertension. Of individuals not receiving anti-hypertensive medication, 976 (20.6%) were hypertensive. Of individuals receiving anti-hypertensive medication, 532 (49.1%) had uncontrolled BP. In the crude screened group, 81.4% declared to not receive any anti-hypertensive treatment, while the remaining 18.6% were on such medications. In overweight and obese patients both systolic and diastolic BP were significantly higher than in normal weight and underweight subjects. In addition, BP measured on Sundays was significantly lower than on Mondays. MMM17 was one of the largest recent BP screening campaigns in Poland. We found that over 1/3 of participants were hypertensive. Almost half of the treated subjects had uncontrolled BP. These results suggest that opportunistic screening can identify substantial numbers with raised BP.

Background

Hypertension is considered the major modifiable, risk factor for all cardiovascular diseases (CVDs), all over the world and the leading global cause of CVD mortality. In 2011, in Poland the NATPOL 2011 Survey was performed to assess the prevalence and control of CV factors, including hypertension in 2401 subjects.¹ Hypertension was detected in 33%. One of the largest Polish epidemiological study WOBASZ (Multi-centre National Population Health Examination Survey), conducted in 2003-2005,² and in 2013-2014,³ included, respectively, 14 755 persons (7783 women) and 6163 persons (3406 women). In the years 2013-2014, the age-standardized prevalence of hypertension, awareness, treatment, and control were 42.7%, 59.3%, 46.1%, and 23%, respectively.³ Interestingly, increased prevalence of hypertension, any anti-hypertensive treatment and effective blood pressure (BP) control were observed during the decade. In contrast, the awareness decreased non-significantly.^{2,3} The prevalence of hypertension in Poland is high and increased by some 12% in 10 years. In another study, PolSenior, the random sample of 4950 participants aged 65-104 years, participated in a cross-sectional, nationally representative survey.⁴ About 80% of septuagenarians were hypertensive. Hypertension prevalence decreased with age to 67% in females and 60% in males over 90. In Poland, CVDs have been the leading cause of mortality, however, with gradual decline since 1991. In 1991, CVDs caused 47.7% of all deaths (42.8% in men and 53.3% in women).⁵ In 2014, 169 735 people died due to CVDs (441.1/100 000). That accounted for 45.8% of all deaths (40.9% in men and 51.1% in women).⁶ The age-adjusted CVD mortality declined by 27% in males and 30% in females in the years 1991-2013.⁶ May Measurement Month (MMM) is a global initiative organized by the International Society of Hypertension aimed at raising awareness of high BP. The aim of the study in Poland was to raise awareness of BP and to detect untreated and uncontrolled hypertension.

Methods

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 approved MMM17 protocol. In Poland 5834 (98.9%, White, Caucasian) individuals were screened. Each participant had their BP measured three times and received a questionnaire about demographic, lifestyle, and environmental factors. The study received the auspices of Polish Societies of: Cardiology, Hypertension, Nephrology, Family Physicians, and Study on Lipids and was approved by Local Ethical Committee. A total of 443 study sites took part. Funding came from non-public chains of family physicians' network, non-public outpatients' clinics, and pharmaceutical companies. Screenees were recruited by the public health messages and endorsements, family physician offices, non-public outpatient clinics, and pharmacies. The campaign started 8 May and lasted till 11 June. Three-seated recordings were taken on the left arm (preferably) with 1-min intervals between readings. Automated Omron and Microlife healthcare electronic devices were used. Hypertension was defined as systolic BP ≥ 140 mmHg or diastolic BP ≥ 90 mmHg, or both, or whether the participant was receiving anti-hypertensive medication. Weight and height were also measured. Data were collected via the MMM App and analysed centrally by MMM project team.

Results

A total of 5834 subjects were screened, of whom 3351 were females and 2483 were males. Supplementary material online, *Table S1* presents basic characteristics of the studied population. Most of the measurements were taken during working days, but also representative data were collected during weekends (see Supplementary material online, *Table S2*), 5808 of the total 5834 participants had three BP measurements. Both systolic and diastolic values slightly decreased at each examination (see Supplementary material online, *Table S3*).

In 2061 (35.3%, $n = 5833$) hypertension was diagnosed based on BP values, independently of the previous status (hypertensives or not, treated or untreated). Of 1084 patients receiving anti-hypertensive medication 532 (49.1%) were uncontrolled. Our measurements revealed hypertension in 976 (20.6%) subjects not on any anti-hypertensive treatment.

Both systolic and diastolic BP increased with body weight (BMI). Almost linear correlations are shown in Supplementary material online, *Figure S1*. Systolic BP was

significantly higher in patients treated with anti-hypertensives, diabetics, with previous myocardial infarction or stroke, in smokers and in alcohol consumers (see Supplementary material online, *Figure S2*). Diastolic BP in those groups was also higher but not always significantly.

Very interesting results were obtained when the days of measurements were compared (see Supplementary material online, *Figure S3*). Both systolic and diastolic BPs were significantly lower on Sunday as compared to Monday.

Discussion

In 35.3% of the study population, BP values were considered hypertensive and of individuals receiving anti-hypertensive medication, 532 (49.1%) had uncontrolled BP. In the whole MMM17 study, BP was highest on Saturdays and Sundays⁷ but in Poland they were lowest on Sunday—perhaps reflecting the usual leisure enjoyed on Sunday. Our results corroborate findings of the whole MMM17 study when adjusted BP was higher in association with anti-hypertensive medication, diabetes, cerebrovascular disease, smoking, and alcohol consumption.⁷ MMM was the largest study in Poland addressing treatment rates and hypertension control in adults. Our results suggest that opportunistic screening can identify significant numbers with raised BP for prompt diagnosis and treatment. In previously published studies WOBASZ, NATPOL, and PolSenior,^{1–4} lower numbers were examined. In addition, in WOBASZ sampling was performed in three stages, stratified according to voivodships (Polish districts), type of community, and gender.^{2,3} However, there are some limitations as BP measurements were performed on only one visit. Therefore, the WOBASZ results may either overestimate the prevalence of hypertension and/or underestimate its control. In addition, the presented BP categories in the whole population include those treated, therefore obtained rates of optimal, correct, and high optimal pressure could be overestimated. In both WOBASZ studies, that is 2003/2005² and 2013/2014,³ the average values of systolic and diastolic BP assessed in all subjects, in both with and without diagnosed hypertension declined significantly in Poland over the studied decade. The awareness, percentage of treated patients, and BP control have improved over the decade, and in the WOBASZ II study in the whole population aged 19–99 years they were 59.3%, 46.1%, and 23%, respectively.³ It was probably due to an increased number of effectively treated patients, and an increased number of patients with adequately controlled BP. We may also speculate that it may be caused by healthier lifestyle.^{8,9} On the other hand, only 27.1% of the patients aged 19–99 had optimal BP. In the most recent Polish study LIPIDOGRAM2015, unpublished data yet, hypertension prevalence was 40.1% in general primary care adult population (35.3% in women, 48.3% in men). In the 2002 NATPOL PLUS study, hypertension was diagnosed based on home measurements of the respondents during three separate visits. The prevalence of hypertension according to the number of visits was 36.4%, 31.3%, and 29.4% for 1, 2, and 3 visits, respectively.¹ Prevalence of hypertension increased from 30% to 32% between 2002 and 2011² in NATPOL study,

whereas in WOBASZ studies it increased from 34.7% to 39.0% in the whole population. In our MMM17 study, hypertension prevalence was similar (35.3%). However, awareness of hypertension in the NATPOL study increased within a decade from 66% to 72%,² whereas in WOBASZ and WOBASZ II studies it non-significantly decreased from 55.2% to 54.2%. The effectiveness of hypertension treatment in NATPOL PLUS and NATPOL 2011 studies measured the percentage of patients with SBP <140 mmHg and DBP <90 mmHg among all patients with hypertension, which increased over 10 years from 12% to 26%.² In MMM17 almost half of the hypertensive patients have unsatisfactory BP control. It strongly supports the rationale to raise not only the awareness but also to ensure prompt and adequate control of BP to prevent or at least delay long-term complications.

Conclusions

MMM17 was one of the largest recent BP screening campaigns in Poland. Elevated BP was found in about one-third of the participants. Almost half of already treated individuals still had uncontrolled BP. Undetected and uncontrolled hypertension is a problem that medical professionals in outpatient settings should pay much more attention to. A large-scale screening programme is justified since it can identify substantial numbers of individuals with raised BP and implement the appropriate treatment.

Supplementary material

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

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