

May Measurement Month 2018-2019: an analysis of blood pressure screening results from Austria

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KEYWORDS

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Arterial hypertension is a global burden leading to over 10.8 million deaths per year worldwide. May Measurement Month (MMM) is a global project initiated by the International Society of Hypertension to raise the awareness of high blood pressure (BP) in the population. Following the MMM protocol 2508 participants ≥ 18 years had their BP measured in Austria in MMM18 and MMM19. Of those screened, 54.6% were found to be hypertensive, defined as a BP $\geq 140/90$ mmHg and/or being on treatment for hypertension. Among those individuals with hypertension, 56.1% were on medication but only 42.0% of those treated had controlled BP ($< 140/90$ mmHg). Lower BPs were found in those with previous myocardial infarction (MI), probably explained by a medical monitoring system of patients with MI in Austria. Those with hypertension were referred for further medical investigations and were provided lifestyle advice. Among a high number of individuals receiving antihypertensive treatment, BP is still not controlled. Further screening and monitoring of therapeutic effects is urgently required.

Introduction

Arterial hypertension is the most important risk factor for cardiovascular disease (CVD) and all-cause mortality worldwide leading to 10.8 million deaths per year.^{1,2} Even though arterial hypertension is easy to diagnose and clear strategies for lifestyle advice and pharmacological therapies are provided,³ blood pressure (BP) control is reached only in a small number of hypertensive patients.

Important contributing factors are low levels of awareness and poor screening for elevated BP.^{4,5} Data from a previous study showed an alarming number of treated but uncontrolled hypertensives in Austria.⁶ The Austrian Society of hypertension joined the May Measurement Month (MMM) campaign in 2018 and 2019 to further improve screening and public awareness in Austria.^{7,8}

Methods

The cross-sectional survey MMM was initiated by the International Society of Hypertension in 2017. Data

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Table 1 Total participants and percentages with hypertension, awareness, on medication and with controlled BP

Total participants	Number (%) with hypertension	Number (%) of hypertensives aware	Number (%) of hypertensives on medication	Number (%) of those on medication with controlled BP	Number (%) of all hypertensives with controlled BP
2508	1370 (54.6%)	927 (67.7%)	768 (56.1%)	322 (42.0%)	321 (23.5%)

collected in the Austria MMM campaigns in 2018 and 2019 are included in these analyses.

Organized by the local study coordinator and current president of the Austrian Society of Hypertension, ethical approval was obtained by the local ethics committee, and volunteer staff (nurses, students, doctors) were recruited. No further funding was obtained. Recruiting sites were set up in public areas, shopping malls, and primary and secondary health care facilities on several days in 2018 and due to local circumstances only on two days in 2019. The analysis included adults (≥ 18 years) who were passing by and gave consent to participate in MMM. They completed a questionnaire on demographic, lifestyle, and medical history. After resting for three to five minutes, three measurements with one-min intervals between the measurements were recorded by trained staff with automated upper arm BP devices, according to current European Society of Hypertension (ESH) guidelines.³ Mean BP calculated from the second and third reading were used for the analysis.

Hypertension was defined as a systolic BP ≥ 140 mmHg and/or diastolic BP ≥ 90 mmHg and/or being on treatment for hypertension. Controlled BP was defined as a systolic BP <140 mmHg and a diastolic BP <90 mmHg in participants on treatment. Those who had elevated BP were provided with printed lifestyle advice and referred to their general physician or included to a specific Austrian educational program for patients with hypertension (Herz.Leben).⁹

Questionnaire data and BP measurements were entered in an internet-based electronic case report form provided by the MMM project management team. Data were analysed centrally by the MMM project management team and multiple imputation performed to impute the mean of the second and third readings where this was missing, based on remaining available global data as previously described.^{7,8}

Results

A total of 2508 participants were screened (2167 in May 2018; 341 in May 2019). The mean age of all participants was 53.9 ± 18.6 years (53.9 ± 18.6 years in 2018; 54.1 ± 18.7 years in 2019). One thousand four hundred and nine (56.2%) of all participants were female (1212 [55.9%] in 2018; 197 [57.8%] in 2019). Of all participants, 2355 (93.9%) were of White ethnic background. A total of 500 (19.9%) had participated in a previous MMM campaign. Three hundred and eighty four (15.3%) of all participants had never had their BP measured.

Of all participants, 768 (30.6%) were on antihypertensive treatment. 196 (7.8%) of all persons screened reported having diabetes, 124 (4.9%) had a history of a previous myocardial infarction (MI) and 78 (3.1%) a previous history of stroke.

Of all female participants, 20 (1.4%) were pregnant, 5 (2.5%) women reported being hypertensive in a previous pregnancy. Of all participating persons 368 (14.7%) were current smokers, and alcohol intake once or more a week was reported by 114 (4.5%). The mean BMI of all participants was 25.6 ± 4.5 kg/m².

Of all 2508 participants, 1370 (54.6%) had hypertension. Of those 1370 with hypertension, 927 (67.7%) were aware of their diagnosis and 768 (56.1%) were on antihypertensive therapy. Of the participants on antihypertensive medication, 42.0% had controlled BP. Of all 1370 with hypertension, 23.5% had controlled BP (Table 1).

In persons with known hypertension and receiving antihypertensive medication, mean systolic and diastolic BPs were significantly higher (adjusted for age and sex) than those who were unaware of hypertension or not on medication. In those with previous MI, mean systolic BP was 5.8 mmHg lower (95% CI: -9.2 , -2.5) and diastolic BP was 3.4 mmHg lower (95% CI: -5.5 , -1.3) than those without a previous MI. Furthermore, both systolic and diastolic BPs were significantly higher in overweight and obese participants than those with a healthy weight. Participants with a history of stroke showed a tendency to have lower BPs (non-significant) compared with those without a history of stroke.

Discussion

In this large screening campaign, 2508 participants ≥ 18 years had their BP measured in Austria as part of MMM18 and MMM19. 54.6% of them had hypertension defined as a BP $\geq 140/90$ mmHg or on treatment for hypertension. Among those with hypertension, 56.1% were on medication and only 42% of those taking antihypertensive medications had controlled BP. Compared to the Austrian results of MMM17, the proportion of hypertensives and those with uncontrolled BP was smaller in the current population.⁶ In contrast, compared to the results of the global papers of MMM18 and MMM19 the proportion of hypertensives with uncontrolled BP was higher in our participants, although Austria is known for an excellent health care system.^{7,8} Low adherence to medical treatment as well as therapeutic inertia are common problems in the treatment of hypertension in Europe and

worldwide. Structured disease management programs including a multidisciplinary approach⁹ could help to get better BP control but at the moment such programs are not available broadly.

Higher BPs were measured in overweight and obese individuals matching global results.^{7,8}

BP was significantly lower in those with previous MI. This may be due to a monitoring system for patients after MI in Austria and the routine use of BP-lowering agents (e.g. beta-blockers and ACE-inhibitors for such patients). The group of participants with a history of stroke also showed lower BPs (non-significant). This phenomenon might be explained by more intensive post-stroke care for patients with cerebrovascular events in Austria.

A limiting factor may have been the circumstances at the screening sites (public places, noise, heat, other people watching) leading to a false positive rate of hypertensive BP values. The intention of the project was not to assess the prevalence of arterial hypertension in Austria but to raise the awareness of the disease in the population. Those with hypertensive BPs were given advice on lifestyle interventions and were referred to further medical exploration at their general physician or included to a specific educational program.⁹

In summary, the proportion of individuals with uncontrolled BP in Austria is still higher than the average found in the global papers, especially of those receiving antihypertensive treatment. Structured disease management programs and further campaigns that raise the awareness and screening for hypertension are useful and needed.

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Data availability

The data are available from the corresponding author.

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