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May Measurement Month 2018: an analysis of blood pressure screening in Libya

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Elevated blood pressure (BP) is an important public health concern and leads to several adverse cardiovascular outcomes. In the stepwise survey done in Libya by the Libyan Cardiac Society and National Centre for Disease Control in 2009, the percentage of hypertension was 40.6%. To raise awareness of high BP and to highlight the size of the problem and the need for screening. A cross-sectional opportunistic study included men and women aged ≥ 18 years. Blood pressure was measured three times and a questionnaire was completed. Hypertension was defined as BP $\geq 140/90$ mmHg based on the mean of the 2nd and 3rd readings, or on antihypertensive treatment. Among 7279 participants, the mean age was 44.3 ± 14.8 years, 57.8% male, 2567 (35.3%) of the participants had hypertension of whom 63.4% were aware of having hypertension, 55.8% on medication, and of those on medication 50.9% had controlled BP. This survey identified a high proportion of individuals with high BP, which highlights the need for a more strategic approach to fighting hypertension.

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[†]The MMM Data collectors are listed in Supplementary material online.

Introduction

Elevated blood pressure (BP) is an important public health concern, it is highly prevalent and leads to several adverse cardiovascular outcomes, especially coronary heart disease, stroke, and heart failure.¹ Furthermore, it is clear that even small improvements in the management of elevated BP would result in widespread cardiovascular benefit.²

Globally, cardiovascular disease accounts for ~17 million deaths per year, nearly one-third of the total. Of this total, complications of hypertension account for 10.4 million deaths worldwide every year. Hypertension is responsible for at least 45% of deaths due to heart disease, and 51% of deaths due to stroke.²

Libya is situated in North Africa, with an area of almost 1 665 000 km² and a total population 6 358 000 according to the Annual Statistical Report 2016.³ In 2016, cardiovascular diseases estimated to account for 35% of deaths in Libya.⁴

The stepwise survey by Libyan Cardiac Society (LCS), National Center for Disease Control (NCDC), and Ministry of Health-Libya (2009) reported that the percentage of individuals with raised BP $\geq 140/90$ mmHg or currently on medication for raised BP in the age group (25-64 years) were 45.8%, 35.6%, and 40.6% for males, females, and both sexes, respectively. Approximately 40% of hypertension cases were on treatment and only half of them had their BP controlled.⁵

In 2018, Libya participated for the first time in the May Measurement Month (MMM) campaign which is an initiative led by the International Society of Hypertension (ISH) and endorsed by the World Hypertension League. It is a global campaign set up in 2017, to raise awareness about BP and as a pragmatic solution to the lack of formal screening worldwide and to highlight the need for increased screening for hypertension.⁶

Methodology

LCS together in cooperation with NCDC-Libya participated in the worldwide BP awareness campaign (MMM18).

Ethical approval was obtained from the National Center of Disease Control biomedical research ethics committee. The campaign covered seven cities all over Libya. In each city, screening took place at several locations including hospitals, primary care clinics, indoor and outdoor public spaces, pharmacies and workplaces, fields and parks, universities, and some malls. Funding and financial support were sponsored by Servier presented by Alafia company (for pharmaceutical and medical equipment in Libya) and NCDC.

Informed consent was taken by officials responsible for each place. One hundred and seventy-three volunteers including doctors, nurses, and public health workers from different cities, who had experience in measuring BP participated in the campaign, being responsible for BP screening using an automatic or manual sphygmomanometer according to availability. A cross-sectional opportunistic study included both genders who were ≥ 18 years. The

campaign duration was for the whole month of May and extended for another 2 weeks. After taking verbal consent from each participant, an anonymous questionnaire was filled in. Three BP and pulse rate readings were measured in the sitting position, with intervals of 1 min between each reading, from the same arm either from the right or left. The average of the last two readings was taken when analysing the results. In cases where this was missing, multiple imputation was used to impute the missing reading.⁶

Hypertension was defined as systolic BP ≥ 140 mmHg or diastolic BP ≥ 90 mmHg or those on antihypertensive treatment.

Height and weight were recorded where facilities were available or estimated by the team member if facilities were not available.

Data were entered and sent online to the MMM project team for analysis.

Results

The total number of participants who had their BP measured during MMM 2018 in Libya was 7279. In total, 42.1% were females and males accounted for 57.8%. The mean age was 44.3 ± 14.8 years.

Of the total participants, 1747 (24.0%) had never had their BP recorded.

In total, 7191 participants had all three BP readings recorded. After multiple imputation, of 7279 participants, 2567 (35.3%) were diagnosed as hypertensives, of whom 63.4% were aware of being hypertensive, and 55.8% were on antihypertensive medication.

Among those hypertensives who were on medication only 50.9% had their BP controlled. Of all hypertensive participants, only 28.4% were controlled.

There was an association between age and systolic BP in men and women who were not receiving antihypertensive treatment showing a linear increase, with the mean BP in men exceeding the mean BP in women for all ages.

For diastolic BP, highest levels were seen at age 40-65 years for both sexes, with the BP in males higher than in females for all ages ([Supplementary material online, Figure F1](#)).

After adjustment for age and sex, systolic and diastolic BPs were significantly higher in people who were taking antihypertensive medications. Higher BPs were also seen in those who reported having previously been told they had high BP, independent of the association with medication use.

After adjusting for age, sex, and antihypertensive medication, there was higher systolic BP seen in those with diabetes ([Supplementary material online, Figure F2](#)).

Those overweight and obese had significantly higher systolic and diastolic BPs than those of a healthy weight or underweight ([Supplementary material online, Figure F3](#)).

Discussion

MMM18 was the largest organized BP screening both globally and in Libya.

Among 7279 participants enrolled in the survey, more than a third (35.3%) of them had hypertension. The proportion of hypertensives in the Libyan participants of MMM18 was slightly more than the global MMM 18 average (33.4%)⁶ but less than the proportion of hypertension which was reported in a previous national survey which was 40.6%.⁵

Among hypertensives, 63.4% were aware of their condition, and over half of them were on medication (55.8%). Of those on medication, 50.9% had controlled BP, compared with a previous National survey reported that 40.3% of hypertensive patients were on medication, of them 21.3% had controlled BP.⁵

These results highlight a still unsatisfactory BP control in our population, which needs to be adequately dealt with, although a trend towards an improvement over the years seems to become apparent.

In this study, systolic arterial hypertension values were higher in those with diabetes, with increasing age, with obesity, those who were overweight, which is similar to previous data that showed an increase risk of hypertension with increase body mass index⁷ and supports the global results of MMM18⁶ although participants with a history of diabetes mellitus (DM) in Libya exhibited lower diastolic BP unlike in the global population.⁶

A difficult situation and suffering after 2011 in Libya led to difficulties in organizing screening programmes. Joining MMM18 provided a temporary and good solution to increase awareness of hypertension to help identify possible hypertensives and provide data to investigate the correlations between unique risk factors and high BP, highlighting the size of problem and the need to form strategy for primary and secondary prevention as a priority for disease control. MMM is an opportunistic screening campaign that is, simple, free, cost-effective, in single setting, and highly accessible in multiple locations. We hope to continue participating in MMM annually to increase awareness and screening.

However, in this cross-sectional screening, 35.3% of Libyan had hypertension. This is not considered as true prevalence as recruitment was not randomized and hence the sample did not represent the whole population. Further studies are recommended.

Conclusion

The survey identified a high proportion of individuals with hypertension, a significant percentage of which had

uncontrolled BP. The MMM campaign is a simple and cost-effective way to improve public awareness towards hypertension.

Supplementary material

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

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