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May Measurement Month 2019: an analysis of blood pressure screening results from Tunisia

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Control

We performed a May Measurement Month (MMM) screening campaign among adult volunteers aged 18 years old and over in Tunisia. The objective was to raise awareness, and to estimate the prevalence, awareness, treatment, and control of hypertension, one of the main cardiovascular risk factors. Following the MMM protocol, three blood pressure (BP) measurements were taken by physicians and standard interviewing procedures were used to record medical history, socio-demographic, and cardiovascular disease risk factors. Hypertension was defined as a systolic BP $\geq$140 mmHg and/or diastolic BP $\geq$90 mmHg or treatment with antihypertensive medication. From 11 271 adults screened, the prevalence of hypertension was 38.1%. Among those with hypertension, 72.5% were aware of their diagnosis, and 67.5% were treated. BP control was achieved in only 38.2% of all those with hypertension. The study highlights the magnitude of hypertension in Tunisia. There is an urgent need for implementing a comprehensive integrated population-based intervention programme to ameliorate the growing problem of hypertension.

Introduction

Over the past three decades, Tunisia has experienced an epidemiological transition characterized by a rapidly growing burden of non-communicable diseases (NCDs). Cardiovascular diseases are the main cause of death accounting for almost 30% of all deaths. Hypertension remains the major treatable risk factor for cardiovascular disease.[1,2]

According to the Tunisian Health Examination Survey 2016, 28.7% of Tunisians aged 15 years and older are affected by hypertension.[3] This prevalence was only 22.5% in 1997.[4]

For adults aged 35–70 years, the prevalence of hypertension increased from 30.6% in 2005 to 38.0% in 2016.[3,5] Furthermore, 38.1% of those with hypertension were aware and 31.4% were being treated with antihypertensive drugs. Unfortunately, in Tunisia, there is no population-based systematic surveillance of blood pressure (BP). This study in 2019 is the first Tunisian contribution to a May Measurement Month (MMM) survey, which was initiated in 2017 by the International Society of Hypertension.

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Methods

The MMM screening campaigns took place in 12 Tunisian governorates during May and June 2019. These governorates are located in the main regions of the country: the Southern, the Northern, and the Centre.

Sites were set up in a wide range of locations, including supermarkets, workplaces, shopping malls, and in primary healthcare facilities. Participants were informed adults (≥18 years) who volunteered and gave consent to have their BP measured.

The study was conducted by the Cardiovascular Disease Epidemiology and Prevention Research Laboratory of the Faculty of Medicine of Tunis in collaboration with National Observatory for New and Emerging Diseases and the civil society. The sites were set up by 17 co-ordinators: 4 at the national level and 13 at the local level including about 150 investigators. No funding was dedicated for the activities.

The involved personal were trained to measure BP, using validated, automated BP devices (Omron M3 Intellisense Automatic BP Monitor). Recommendations for standard methods included three seated recordings taken on the left arm (preferably) with 1-min intervals between readings. The mean of the second and third readings was used in analyses. A hard copy questionnaire was used to collect additional data from each participant.

Hypertension was defined as a systolic BP of at least 140 mmHg or a diastolic BP of at least 90 mmHg (or both) or taking antihypertensive medication. Uncontrolled hypertension was defined as an average systolic BP ≥140 mmHg or an average diastolic BP ≥90 mmHg, among those on treatment for hypertension.[6] Data were analysed centrally by the MMM project team and multiple imputation was performed to impute the mean of readings two and three where this was missing.[7]

Results

In total, 11 271 adults aged 18 years old and over were included in this study. More women (61.9%) than men were screened. The mean age of the study population was 49.5 (SD ±15.2) years. About a quarter were aged between 50 and 59 years old. More than half was screened in hospital structures.

Smoking was reported by 18.6% and self-reported diabetes by 17.6%. The mean body mass index (BMI) of respondents was 27.5 kg/m^2 (SD ±4.9) and one-quarter of the sample (25.4%) were obese. 3.3% and 2.3% reported a history of myocardial infarction and stroke, respectively and 10.0% used aspirin and 10.1% used a statin.

Overall, 4292 (38.1%) of the adults had hypertension. Amongst them, 3110 (72.5%) were aware of their hypertensive status and 2898 (67.5%) were treated. Of those on treatment, 1640 (56.5%) were controlled and hence 38.2% of all those with hypertension were controlled (*Table 1*).

A linear relationship was shown between both systolic and diastolic BP and increasing levels of BMI with a mean increase of, respectively, 7.3 mmHg [95% confidence interval (CI) 6.4–8.2] and 4.3 mmHg (95% CI 3.7–4.9) comparing those with obesity to those with healthy weight (*Figure 1*).

Discussion

The MMM campaign conducted in 2019 in Tunisia shows that 38.1% of the Tunisian sample screened aged 18 and over were hypertensive, of whom 72.5% were aware of their condition and 67.5% were on treatment for raised BP. The proportion of controlled hypertension among all hypertensives was relatively low: 38.2%. The prevalence of hypertension in Tunisia increased from 22.5% in 1997 to 28.7% in 2016.[3,4] It also increased for adults aged 35–70 years from 30.6% in 2005 to 38.0% in 2016. In contrast, the percentage of diagnosed hypertensive patients has not changed since 2005, when it was 38.8% and reaching 37.8% in 2016 among people between 35 and 70 years old.[5]

The high percentage of diagnosed hypertension recorded in the MMM campaign is mainly due to the fact that more

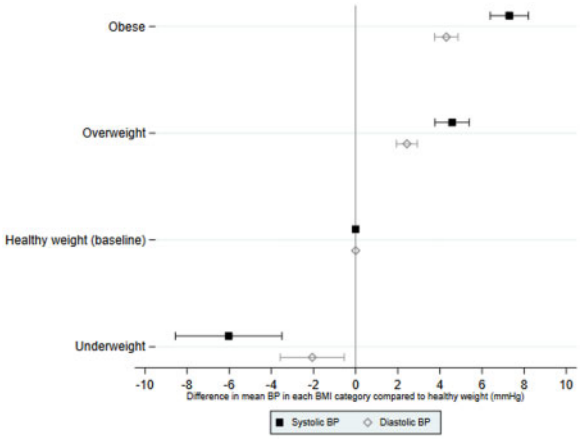


Figure 1 Differences in mean systolic and diastolic blood pressure by body mass index strata compared to those with a healthy weight.

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
11 271 (female 61.9%)	4292 (38.1%)	3110 (72.5%)	2898 (67.5%)	1640 (56.5%)	1640 (38.2%)

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than half of the participants were recruited in Primary Health Centers.

Among treated hypertensives, the percent to achieve control of their BP has remained low for the last two decades.[8]

The campaign within the framework of MMM 2019 confirmed a high prevalence of hypertension amongst the opportunistic sample of Tunisian adults screened and offers an opportunity to sensitize the population to adopt a healthy lifestyle to prevent and control NCDs in general and hypertension in particular.

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MMM Tunisian Working Group

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Conflict of interest: The authors have declared that they have no competing interests.

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