

Nation-wide hypertension screening in Italy: data from May Measurements Month 2017–Europe

Camilla Torlasco^{1,2}, Andrea Faini^{1,2}, Elhassan Makil^{1,2}, Grzegorz Bilo^{1,2}, Martino Pengo¹, Thomas Beaney³, Xin Xia³, Claudio Borghi⁴, Neil R. Poulter³, Giuliano Tocci⁵, Ferruccio Galletti⁶, Giovambattista Desideri⁷, Franco Veglio⁸, Claudio Ferri⁹, and Gianfranco Parati^{1,2*}

¹Department of Cardiovascular, Neural and Metabolic Sciences, Istituto Auxologico Italiano, IRCCS, San Luca Hospital, Piazzale Brescia 20, Milan 20149, Italy;

²Department of Medicine and Surgery, University of Milan-Bicocca, Piazza dell'Ateneo Nuovo 1, 20126, Milan, Italy;

³Imperial Clinical Trials Unit, Imperial College London, Stadium House, 68 Wood Lane, London W12 7RH, UK;

⁴Department of Medical and Surgical Sciences, Faculty of Medicine, Council of the Italian Society of Hypertension, University of Bologna, Via Zamboni 33, 40126, Bologna, Italy;

⁵Division of Cardiology, Department of Clinical and Molecular Medicine, Faculty of Medicine and Psychology, University of Rome "Sapienza" Piazzale Aldo Moro 5, 00185 Roma, Italy; Sant'Andrea Hospital, IRCCS Neuromed, Pozzilli (IS), Council of the Italian Society of Hypertension, Rome, Italy;

⁶Department of Clinical Medicine and Surgery, ESH Excellence Center of Hypertension, "Federico II" University of Naples Medical School, Corso Umberto I 40, 80138 Naples, Italy;

⁷Department of Life, Health and Environmental Sciences, University of L'Aquila, piazza Santa Margherita 2, 67100 L'Aquila, Italy; Council of the Italian Society of Hypertension, L'Aquila, Italy;

⁸Division of Internal Medicine and Hypertension Unit, Department of Medical Sciences, University of Turin, Via Giuseppe Verdi 8, 10124 Turin, Italy; Council of the Italian Society of Hypertension; and

⁹Department of Life, Health and Environmental Sciences, University of L'Aquila, piazza Santa Margherita 2, 67100 L'Aquila, Italy

Elevated blood pressure (BP) is a growing burden worldwide, leading to over 10 million deaths each year. May Measurement Month (MMM) is a global initiative organized 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 programs worldwide. A similar approach has been used in Italy since 2012, showing inadequate awareness of the consequences of hypertension, a generally increased cardiovascular risk and unsatisfactory BP control in 36% of interviewed individuals. An opportunistic cross-sectional survey of volunteers aged ≥ 18 was carried out in May 2017, during the joint MMM and World Hypertension Day events. Blood pressure measurement, the definition of hypertension and statistical analysis followed the standard MMM protocol. Screenings were conducted both in cities and villages, indoor and outdoor, by health personnel. Eighty-five sites, involving approximately 300 investigators, took part in MMM17/World Hypertension Day in Italy, screening 10 076 individuals during a month-long period. After multiple imputation, 3099 participants were found (30.8%) to have high BP levels. This was the biggest opportunistic BP screening in a single time-point ever reported in Italy. A significant proportion of individuals had high BP, although it was not possible to differentiate between known treated hypertensive patients with inadequate BP control and as yet undiagnosed hypertensive individuals. Opportunistic screening can reach a significant number of individuals, being a powerful tool for raising awareness and carrying out BP screening.

*Corresponding author. Tel: +39 02619112949, Fax: +39 02619112956,
Email: gianfranco.parati@unimib.it

Introduction

Atherosclerosis-related cardiovascular diseases (CVD) represent a burden on western countries' health systems. In spite of the many efforts towards primary and secondary prevention, CVDs prevalence is constantly increasing, partly because of unhealthy lifestyle and partly because of the improvements of acute coronary syndromes therapy, which has led to a decrease in the mortality due to coronary events at the cost of a growing number of individuals who live with a damaged heart.¹ At the moment, CVDs remain the main cause of premature death in Europe and one of the most important causes of disability.

The scientific community and the World Health Organisation (WHO) jointly identify primary prevention, and specifically the correction of modifiable risk factors, as the key step towards the goal of CVDs reduction.^{2,3} Among all, arterial hypertension, known as the "silent killer", is the most important independent risk factor for CVDs.⁴

Reported HT prevalence in Italy ranges from 55% to 59% of the whole population >18 years of age,⁵ with a worrisome rate of 11% in the 18-35 years age range.⁶ Moreover, data collected in Italy during the 2014 World Hypertension Day, promoted by the International Society of Hypertension, the World Hypertension League and the Italian Society of Hypertension, showed that individuals are aware of healthy life habits useful to reduce blood pressure (BP) but are not equally aware of the risks linked with hypertension.⁷ As a consequence, they may lack motivation in following healthy lifestyle changes and medical prescription. Thus, we believe that large-scale health campaigns 'in the field' may play a pivotal role not only in screening and assessment of the BP situation at a given time point, but also in educating people regarding the risks and consequences connected to high BP, thus improving adherence to lifestyle modification and medical prescription.

By being part of the May Measurement Month (MMM17) project organized by the International Society of Hypertension, we were able to increase the number of days of data collection, thus reaching more people and involving more health personnel than ever before.

Methods

MMM17 activities in Italy were coordinated by G.P. with the help of C.T. and with the support of the Italian Society of Hypertension. Informed consent was obtained for each participant onsite. No personal information was requested, as all forms were anonymous.

During the month of May 2017, 85 sites in Italy operated for a different number of days (from 1 to 10 days depending on the site), interviewing and measuring the BP of individuals aged 18 and over who decided to stop by. A total estimated number of 300 volunteers were involved in the campaign.

Blood pressure measuring stations were available inside hospitals and at crossroads, with the logistical support of the Italian Red Cross, both in cities and villages. Also, thanks to the support of Italian Navy, BP measurements were available for people visiting the sail training ship

'Amerigo Vespucci' in a number of ports where this historical and world-famous ship made scheduled calls along the peninsula. The initiative was also supported by national government agencies, with many politicians agreeing to take part in this initiative and have their BP measured.

All the staff had a certain degree of training in health care and received specific training on BP measurements. Either doctors, nurses, paramedics and medical students performed the BP recordings and administered an *ad hoc* created questionnaire. Additionally, outdoor measurements were performed in gazebos, in order to keep the ambient temperature controlled and even, and to allow seated rest before the measurement. All selected devices had been validated accordingly to the ESH-IP approach and BP measurements were performed according to the European Society of Hypertension/European Society of Cardiology (ESH/ESC) 2013 guidelines. Briefly, three consecutive measurements were collected in the sitting position, at rest with back and arm supported, after a 5-min rest. Hypertension was defined as BP $\geq 140/90$ mmHg and/or taking antihypertensive medication.

The study was bottom funded, i.e. each centre which decided to take part in the activity printed its own questionnaires and BP forms and then sent the hard copies to the core lab for data entry. Data were checked and cleaned locally by E.M. and A.F. and analysed by the MMM team according to the standard analysis plan.

Results

A total of 10 076 people were screened during the month of May 2017.

Of these 10 076 individuals, 4959 (49.2%) were females. Mean age (\pm standard deviation) was 53.7 years (± 17.9 years). Blood pressure results across the three readings are shown in *Table 1*, showing a decline from the first, to second, to third readings.

For BP analysis, the mean of the second and third measurements were used (available in 10 014 individuals). The mean systolic BP was 129.7 mmHg, and mean diastolic BP was 78.1 mmHg. After imputation, a mean reading was available for 10 075 individuals. The total number with hypertension was 3099, representing 30.8% of the total.

Discussion

There is great awareness in the Italian scientific community and among officers of the Italian Health Care System about the hypertension problem, with the Italian Society of Hypertension being very active in educational campaigns and large-scale data collection. During the last few years, a yearly event focused on subjects' education on hypertension among the Italian population and on BP measurements was organized, gaining progressively more and more attention and involving an increasing number of people.⁶⁻⁸

The present cross-sectional survey provides a contemporary update on BP values collected nation-wide from a remarkable sample of the Italian population. As described, a proportion of 30.8% of the screened individuals were found

Table 1 Blood pressure results across each reading

	Reading 1	Reading 2	Reading 3	Mean of readings 2 and 3
Mean systolic blood pressure (mmHg)	131.7	130.2	128.7	129.7
Mean diastolic blood pressure (mmHg)	78.6	78.2	77.6	78.1
Note: number of individuals with all three readings available	Total number of subjects with three readings: 10 007			

to be hypertensive, a percentage slightly less than the one reported by Torlasco *et al.*⁸ in a similar previous campaign (36% among a sample of 8657 individuals, focusing on data collected in year 2015 in a similar fashion). Similarly, the mean BP values of the current sample are similar to those that were reported by Tocci *et al.*⁵ from 2004 to 2010 ($131/79 \pm 19/11$ mmHg) and by Torlasco *et al.*⁸ in 2015 ($133/80 \pm 18/10$ mmHg).

Unfortunately, the available data do not allow differentiation between known treated hypertensive patients with inadequate BP control and yet undiagnosed hypertensive people. Moreover, the current lack of recommended BP thresholds and targets for BP values obtained in the frame of this 'street epidemiology' campaign, based on such a peculiar type of out-of-office BP measurement technique, makes it unclear how to properly interpret the data collected. Nevertheless, based on extrapolation from previous surveys, we believe that these results highlight a still unsatisfactory BP control in a large sample of the Italian population, which needs to be adequately dealt with, although a trend towards an improvement over the years seems to become apparent.

Joining the MMM Campaign, we have been able to interview the largest number of people approached in a single time point so far, also measuring their BP in a carefully standardized manner. The results we have obtained support the belief that population-based campaigns provide a significant contribution to spread awareness, stimulate curiosity and collect data in large numbers of individuals over a relatively short time window. Moreover, the results obtained in this and in previous campaigns demonstrate how this kind of population screening might be useful to reach specific subgroups in a population, e.g. the young adults, which are usually healthy and rarely feel the need to engage in primary prevention focusing on risk factors and subclinical conditions, also because of their limited interactions with general practitioners resulting, among other problems, in having BP measured very rarely.

Acknowledgments

We would like to thank all the local investigators, without whom this data collection would not have been possible, the Italian Red Cross for its support with volunteers and means, the Italian Navy and the Presidency of the Italian Republic for their kind availability to endorse and host the campaign.

Contributors

Lorenzo Ghiadoni¹, Immacolata Panettieri², Paolo Pualetto³, Roberto Pontremoli⁴, Michele Stornello⁵, Enrico Agabiti Rosei⁶, Bruno Trimarco⁷, Francesco Cipollone⁸, Nicola De Luca⁹, Pasquale Strazzullo¹⁰, Luciano Di Meo¹¹, Maria D'Avino¹², Aniello de Leo¹³, Guido Iaccarino¹⁴, Stefano Urbinati¹⁵, Renzo Roncuzzi¹⁴, Aderville Cabassi¹⁶, Giuseppe Crippa¹⁷, Claudio Guadagni¹⁸, Angelo Ghirarduzzi¹⁹, Leonardo Sechi²⁰, Massimo Volpe²¹, Rosario Cianci²², Paolo Cicconetti²³, Mario Compagnucci²⁴, Anna Caparra²⁵, Claudio Letizia²⁶, Michelangelo Malacrinis²⁷, Dario Manfellotto²⁸, Marco Mettimano²⁹, Angelo Scuteri³⁰, Massimiliano Uccelli³¹, Cristina Giannattasio³², Giuseppe Mancia³³, Cesare Formaini³⁴, Rosario Ariano³⁵, Guido Garavelli³⁶, Fabio Albinì³⁷, Massimo Crippa³⁸, Gaetana Palumbo³⁹, Stefano Carugo⁴⁰, Chiara Lonati⁴¹, Roberto Meazza⁴², Ciro Esposito⁴³, Claudio Pini⁴⁴, Antonio Cantalamessa⁴⁵, Francesca Sabotto⁴⁶, Maurizio Destro⁴⁷, Andrea Maresca⁴⁸, Annamaria Grandi⁴⁸, Riccardo Sarzani⁴⁹, Giuseppe Lembo⁵⁰, Aldo Ortensia⁵¹, Alessandro Rossi⁵², Roberto Boero⁵³, Claudio Pascale⁵⁴, Adele Nardecchia⁵⁵, Pietro Nazzaro⁵⁶, Giuseppe Ranieri⁵⁷, Giuseppe De Giorgi⁵⁸, Antonio Del Giudice⁵⁹, Antonio Virdis⁶⁰, Santina Cottone⁶¹, Francesco Schembari⁶², Ferdinando D'Amico⁶³, Stefano Taddei⁶⁴, Paolo Borgheresi⁶⁵, Salvatore Lenti⁶⁶, Andrea Ungar⁶⁷, Franco Cipollini⁶⁸, Paolo Verdecchia⁶⁹, Giacomo Pucci⁷⁰, Gianpaolo Rossi⁷¹, Pietro Minuz⁷², Francesco Fallo⁷³, Alberto Mazza⁷⁴, Marcello Rattazzi⁷⁵, Cristiana Leprotti⁷⁶, Fabio Ragazzo⁷⁷, Giulia Balbi⁷⁷, and Franco Rabbia⁷⁸

¹Department of Clinical and Experimental Medicine, University of Pisa, Council of the Italian Society of Hypertension, Pisa, Italy; ²Centro per la Diagnosi e la Cura dell'Ipertensione Arteriosa, Council of the Italian Society of Hypertension, Policlinico di Foggia, Italy; ³Department of Medicine, University of Padova, Italy; ⁴Medicina I, Council of the Italian Society of Hypertension, Ospedale Ca' Foncello, Treviso, Italy; ⁵Centro per la Diagnosi e Cura dell'Ipertensione Arteriosa, Council of the Italian Society of Hypertension, AOU San Martino, Italy; ⁶Direttore UO Medicina Interna & Stroke Unit "L. Scapellato"—Centro per la Diagnosi, la Cura e la Prevenzione delle Cardio e Cerebrovasculopatie—Ospedale "Umberto I"—ASP Siracusa, Council of the Italian Society of Hypertension, Italy;

⁶Centro per la prevenzione e cura dell'ipertensione Arteriosa, Università degli studi di Brescia, Council of the Italian Society of Hypertension, Italy; ⁷Department of Advanced Biomedical Sciences, Federico II University of Naples, Council of the Italian Society of Hypertension, Italy; ⁸Centro per l'Aterosclerosi e l'ipertensione Arteriosa, AO Chieti, Italy; ⁹Centro Ipertensione, A.O.U. Federico II of Naples, Italy; ¹⁰Medicina Interna, Ipertensione e Prevenzione Cardiovascolare, A.O.U. Federico II of Naples, Italy; ¹¹Centro Ipertensione e Prevenzione Cardiovascolare—ASL CE Distretto 14, Italy; ¹²UOSS Diagnosi e Terapia dell'ipertensione Arteriosa, A.O.R.N. A. Cardarelli, Italy; ¹³Ambulatorio per l'ipertensione Arteriosa e la Prevenzione del Rischio Cardiovascolare, Ospedale Fatebenefratelli, Italy; ¹⁴Azienda Ospedaliera Universitaria San Giovanni di Dio e Ruggi d'Aragona, Italy; ¹⁵U.O. Cardiologia, Ospedale Bellaria, Italy; ¹⁶Centro Studi Ipertensione Arteriosa e Malattie Cardio-Renali, Dipartimento Clinica Medica di Parma, Italy; ¹⁷U.O.S. Ipertensione Arteriosa e Malattie Cardiovascolari. Ospedale Guglielmo Da Saliceto, Italy; ¹⁸Centro per la diagnosi e cura dell'ipertensione Arteriosa, Polo Sanitario Ravenna 33, Italy; ¹⁹SC Medicina II—Angiologia, Arcispedale Santa Maria Nuova, Italy; ²⁰Centro Ipertensione, Clinica Medica Università di Udine, Italy; ²¹Centro per la Diagnosi e Cura dell'ipertensione Arteriosa, A.O. Sant'Andrea, Italy; ²²Centro “Marcello Malpighi per la diagnosi e la cura dell'ipertensione arteriosa”, Azienda Policlinico Umberto I—UOC di Nefrologia B, La Sapienza Università di Roma, Italy; ²³Ipertensione Geriatrica, Università “Sapienza” di Roma, Italy; ²⁴Ambulatorio per l'ipertensione Arteriosa, A.O. San Camillo Roma, Italy; ²⁵Centro per lo Studio dell'ipertensione Arteriosa e degli Altri Fattori di Rischio, Azienda Policlinico Umberto I di Roma, Italy; ²⁶Centro dell'ipertensione Secondaria, Centro di Riferimento della Regione Lazio dell'ipertensione Secondaria ed Endocrinopatie di difficile diagnosi, Università di Roma Sapienza, Azienda Policlinico Umberto I di Roma, Italy; ²⁷Centro Ipertensione—A.O. S. Giovanni Addolorata di Roma, Italy; ²⁸Centro Ipertensione Arteriosa e Gestazionale, Ospedale Fatebenefratelli Roma, Italy; ²⁹Policlinico Universitario Agostino Gemelli di Roma, Italy; ³⁰Centro Ipertensione Arteriosa—UOC Ipertensione e Nefrologia—Policlinico Tor Vergata, Italy; ³¹S.C. Medicina Interna, Ospedale Santa Corona, Italy; ³²Ambulatorio Ipertensione, Ospedale Niguarda Ca' Granda e Università di Milano Bicocca, Italy; ³³Centro Studi Ipertensione e Malattie Vascolari—Policlinico di Monza, Italy; ³⁴Azienda Ospedaliera Mellino Mellini, Italy; ³⁵Ambulatorio per la diagnosi e terapia dell'ipertensione arteriosa, U.O. Nefrologia A.O. di Cremona, Italy; ³⁶Ambulatorio per Ipertensione Arteriosa, U.O. Medicina, A.O. di Cremona, Italy; ³⁷Ambulatorio Ipertensione e Protezione Cardiovascolare Milano Nord, Italy; ³⁸Unità semplice di diagnosi e trattamento dell'ipertensione arteriosa, P.O. Gardone Val Trompia, A.O. Spedali Civili di Brescia, Italy;

³⁹Azienda Ospedaliera Ospedale di Legnano, Italy; ⁴⁰ASST—Santi Paolo e Carlo, Italy; ⁴¹Centro Ipertensione Arteriosa, Ospedale Classificato San Giuseppe, Italy; ⁴²Centro di Fisiologia Clinica e Ipertensione, Ospedale Maggiore Policlinico, Italy; ⁴³Centro per lo Studio e la Cura dell'ipertensione Arteriosa, Fondazione Salvatore Maugeri, Italy; ⁴⁴ASST Lariana—Ospedale Sant'Anna, Italy; ⁴⁵Habilita Ospedale di Sarnico U.O. Medicina Generale, Centro Cardiometabolico-Ambulatorio di Ipertensione Arteriosa, Italy; ⁴⁶Ospedale Galmarini di Tradate, Italy; ⁴⁷Struttura Complessa Medicina Generale, Azienda Ospedaliera Treviglio, Ospedale Treviglio Caravaggio, Italy; ⁴⁸Centro per la diagnosi e Terapia dell'ipertensione Arteriosa, UO Medicina1, Ospedale di Circolo e Fondazione Macchi ASST Sette Laghi, Italy; ⁴⁹Centro Ipertensione Arteriosa e Malattie Cardiovascolari, AO “Ospedali Riuniti” Torrette di Ancona, Italy; ⁵⁰IRCCS Neuromed—Polo Didattico Sede distaccata Molise, “Sapienza” Università di Roma, Italy; ⁵¹Ambulatorio per Ipertensione Nefrovascolare, AON S.S. Antonio e Biagio e Cesare Arrigo—Alessandria, Italy; ⁵²Servizio per Ipertensione Medicina Interna, Ospedale di Chieri, Italy; ⁵³S.C. Nefrologia e Dialisi, Ospedale Martini, Italy; ⁵⁴Ambulatorio Ipertensione, Ospedale Cottolengo, Italy; ⁵⁵Centro per l'ipertensione Arteriosa U.O.C. Oncologia Medica Universitaria, A.O.U.P. Bari, Italy; ⁵⁶Centro di Prevenzione Cerebrovascolare ed Ipertensione Arteriosa “A.M. Pirrelli”, Italy; ⁵⁷Centro Ipertensione Arteriosa, AOU Policlinico di Bari, Italy; ⁵⁸Centro Ipertensione Ospedale Vito Fazzi, Lecce, Italy; ⁵⁹Ospedale Casa Sollievo della Sofferenza—IRCCS Dipartimento di Scienze Mediche—S.C. di Nefrologia e Dialisi, Italy; ⁶⁰Centro Prevenzione, Diagnosi e Terapia dell'ipertensione Arteriosa e delle Complicanze Cardiovascolari—Azienda ASL di Sassari, Italy; ⁶¹U.O. Dipartimentale di Nefrologia ed Ipertensione, Italy; ⁶²Struttura Complessa Cardiologia—UTIC Ospedale Maggiore di Modica, Italy; ⁶³Ambulatorio Monitoraggio della Pressione Arteriosa, Presidio Ospedaliero di Patti, Messina, Italy; ⁶⁴Centro Eccellenza ESH—Centro per la cura e la diagnosi dell'ipertensione Arteriosa, A.O.U. Pisana, Italy; ⁶⁵Ambulatorio cardiologico per la diagnosi e terapia dell'ipertensione arteriosa, Italy; ⁶⁶Centro Ipertensione Arteriosa di Il livello—U.O.C. Medicina Interna e Geriatria Ospedale San Donato USL8 Arezzo, Italy; ⁶⁷Centro di Riferimento Regionale per l'ipertensione Arteriosa dell'anziano della Regione Toscana, Cardiologia e Medicina Geriatrica, AOU Careggi e Università di Firenze, Italy; ⁶⁸Ambulatorio Specialistico per l'ipertensione Arteriosa, U.O. Medicina Interna, Ospedale San Jacopo, Pistoia, ASL 3 Toscana, Italy; ⁶⁹Centro Ipertensione Arteriosa, Ospedale di Assisi, Italy; ⁷⁰Centro Ipertensione Arteriosa—Dipartimento di Medicina, Università degli Studi di Perugia, Struttura Complessa di Medicina Interna, A.O. S. Maria, Terni, Italy; ⁷¹Centro Eccellenza ESH—Centro per l'ipertensione Arteriosa, A.O. Padua, Italy; ⁷²UOC Medicina Generale per lo Studio ed il Trattamento della Malattia Ipertensiva, Dipartimento di

Medicina Università di Verona ed Azienda Ospedaliera Universitaria Integrata Verona Policlinico GB Rossi, Italy; ⁷³Ambulatorio Divisionale e dell'Attività di Ricovero per il Settore dell'Iperensione Arteriosa, A.O.U. Padua, Italy; ⁷⁴Centro per la Lotta e la Cura dell'Iperensione Arteriosa—AO Rovigo, Italy; ⁷⁵Università degli Studi di Padova, Dipartimento di Medicina-DIMED; ULSS 9 di Treviso, Dipartimento di Medicina Interna, S.C. di Medicina Interna 1, Italy; ⁷⁶Centro per L'iperensione Arteriosa, U.O.S.D. Venice, Italy; ⁷⁷Ambulatorio Iperensione Arteriosa—Vicenza (VAIA) Azienda ULSS 6 VICENZA—Ospedale S. Bortolo—Dipartimento di Area Medica 1—Unità Operativa Medicina Interna, Italy; and ⁷⁸Città della salute e della scienza of Turin, Italy

Conflict of interest: none declared.

References

1. NCD Risk Factor Collaboration (NCD-RisC). Worldwide trends in blood pressure from 1975 to 2015: a pooled analysis of 1479 population-based measurement studies with 19.1 million participants. *Lancet* 2017;**389**:37-55.
2. Mancia G, Fagard R, Narkiewicz K, Redón J, Zanchetti A, Böhm M, Christiaens T, Cifkova R, De Backer G, Dominiczak A, Galderisi M, Grobbee DE, Jaarsma T, Kirchhof P, Kjeldsen SE, Laurent S, Manolis AJ, Nilsson PM, Ruilope LM, Schmieder RE, Sirnes PA, Sleight P, Viigimaa M, Waeber B, Zannad F; Task Force Members. 2013 ESH/ESC Guidelines for the management of arterial hypertension: the Task Force for the management of arterial hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). *Eur Heart J* 2013;**34**:2159-2219.
3. Whelton PK, Carey RM, Aronow WS, Casey DE Jr, Collins KJ, Dennison Himmelfarb C, DePalma SM, Gidding S, Jamerson KA, Jones DW, MacLaughlin EJ, Muntner P, Ovbigele B, Smith SC Jr, Spencer CC, Stafford RS, Taler AJ, Thomas RJ, Williams KA Sr, Williamson JD, Wright JT Jr. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APHA/ASH/ASPC/NMA/PCNA Guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: executive summary: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Hypertension* 2018;**71**:1269-1324.
4. WHO. A global brief on hypertension. Silent killer, global public health crisis. 2013. WHO/DCO/WHO/2013.2. https://www.who.int/cardiovascular_diseases/publications/global_brief_hypertension/en/ (accessed on 25 Feb 2019).
5. Tocci G, Muiesan ML, Parati G, Agabiti Rosei E, Ferri C, Virdis A, Pontremoli R, Mancia G, Borghi C, Volpe M. Trends in prevalence, awareness, treatment, and control of blood pressure recorded from 2004 to 2014 during World Hypertension Day in Italy. *J Clin Hypertens* 2016;**18**:551-556.
6. Bruno RM, Pucci G, Rosticci M, Guarino L, Guglielmo C, Agabiti Rosei C, Monticone S, Giavarini A, Lonati C, Tortlasco C, Fedecostante M, Manzi MV, Pezzutto F, Di Pilla M, Artom N, Battistoni A, Pignatelli G, Sanga V, Pengo MF. Association between lifestyle and systemic arterial hypertension in young adults: a national, survey-based, cross-sectional study. *High Blood Press Cardiovasc Prev* 2016;**23**:31-40.
7. Tortlasco C, Santini F, Liu X, Faini A, Parati G. Awareness of hypertension consequences is less than awareness of risk factors for hypertension. *J Cardiovasc Med* 2017;**18**:563-565.
8. Tortlasco C, Faini A, Makil E, Ferri C, Borghi C, Veglio F, Desideri G, Agabiti Rosei E, Ghiadoni L, Pauletto P, Pontremoli R, Stornello M, Tocci G, Galletti F, Trimarco B, Parati G. Cardiovascular risk and hypertension control in Italy. Data from the 2015 World Hypertension Day. *Int J Cardiol* 2017;**243**:529-532.