Coll. Antropol. **33** (2009) 1: 65–70
Original scientific paper

Comparison between Continuous Ambulatory Arterial Blood Pressure Monitoring and Standard Blood Pressure Measurements among Patients of Younger and Older Age Group

Betty Korljan Babić[1], Jugoslav Bagatin[1], Slaven Kokić[1], Sanja Baršić Ostojić[2], Vedran Carević[1] and Nina Berović[1]

[1] University Hospital Center »Split«, Split, Croatia
[2] General Hospital »Sveti Duh«, Zagreb, Croatia

A B S T R A C T

The purpose of the study was to evaluate whether there is a difference between blood pressure measured in a physician's office and the average 24hr continuous blood pressure monitored by hypertensive patients at home. If there is a difference between these two situations then is it possibly the result of a blood pressure response by the patient to the physician which is known as »white coat effect« or »white coat hypertension«. We studied 80 hypertensive outpatients which were divided into two groups of 40 patients each – a younger patient group, with a mean age of 22.8 ± 1.8 years, and an older patient group with a mean age of 50.3 ± 5.7 years. They were selected because they had been diagnosed as essentially hypertension grade 1, according to 2007 ESH/ESC Guidelines, or the USA Joint National Committee Guidelines (JNC 7) (i.e., arterial blood pressure > 140/90 mm Hg and <160/100 mmHg) and 35 were not having any antihypertensive treatment. All participants in the study went through a two-week »wash-out« period without medication. At the beginning of the study blood pressure was measured using the Riva-Rocci-Korotkoff method (mercury sphygmomanometer) after 5 minutes of rest and with the patient in the sitting position. The average of the two last measurements by sphygmomanometer was used in the analysis. The subsequent measurement was made by continuous ambulatory blood pressure monitoring (SpaceLabs 90207 device). Continuous ambulatory blood pressure monitoring revealed that 17 patients of the younger age group (42.5%) who were diagnosed hypertonic, according to mercury sphygmomanometeric measurement, were in fact normotonic. In the older age group only 7 (17.5%) of participants were normotonic during 24hr blood pressure monitoring. The proportion of miss-diagnosed normotonic younger patients was directly related to elevated clinic blood pressure, which could be referred to as office hypertension or isolated clinic hypertension (white coat hypertension). This was statistically significant ($\chi^2=5.95$; $p=0.015$). Hypertension diagnosed in younger patients based only on occasional doctor's office mesuraments, using a mercury sphygmomanometer, could be miss-interpreted and treated as the start of arterial hypertension. This could sometimes have unwanted results due to the side effects of precipitate antihypertensive medication as well as the unnecessary cost of testing, cost of treatment, prevalence of white-coat hypertension at baseline, and the varying incidence of new hypertension after the initial screening. The results indicate a potential savings of 3–14% in the cost of care for hypertension, and a 10–23% reduction in treatment days when ambulatory blood pressure monitoring is incorporated into the diagnostic process[11]. Therefore CABPM should be used as a legitimate method in the diagnosing of »white coat hypertension«, particularly in young patients. The identification of »white coat hypertensive«' patients should be followed by a search for metabolic risk or organ damage using the latest guidelines, and medication should start after an organ damage or cardiovascular risk assesement[2,5,6].

***Key words**: hypertension, white-coat, blood pressure monitoring, ambulatory*

Received for publication December 11, 2008

Introduction

Arterial hypertension is one of the major risk factors for cardiovascular diseases. The prevalence of hypertension varies from 10–20% and it depends on the level of arterial blood pressure which is defined as hypertensive[1–3]. The fact is that the prevalence of hypertension has socioeconomic and medical importance[4] because hypertension is present in the majority of other cardiovascular diseases (myocardial infarction, heart failure, cerebral insult and renal diseases) and for 30% of patients it is a direct cause of death[2,4–6]. The lowest mortality rate is found in people with systolic blood pressure (BP) between 110–120 mm Hg and diastolic BP between 70–80 mm Hg and it increases with the deviations of these values. High prevalence of hypertension in well-developed countries, as well as the fact that its treatment significantly lowers the risk for cardiovascular complications, imposes the control of this risk factor as a priority objective of the health service. Persistent arterial hypertension (arterial blood pressure ≥ 140/90 mm Hg) is diagnosed only after repeated measurements of arterial blood pressure which can be done (a) at home, (b) at a physician's office, or (c) by ambulatory blood pressure monitoring[2,6].

Continuous ambulatory BP recordings give more reproducible values over fairly long periods of time compared with the doctor's office BP[7–9]. Continuous ambulatory blood pressure monitoring (CABPM) is proven to be reliable and gives a more valid image of the vascular weight of hypertension than a small number of BP readings in the physician's office[7–10,13], but due to technical and economic reasons it isn't used as much as it should be in hypertonic patients. Although the accurate diagnosis of hypertension and prognosis for future cardiovascular events can be enhanced through the use of 24hr ambulatory blood pressure monitoring[10–13].

A hypertension is usually diagnosed on the basis of repeated standard BP measurements by the Riva-Rocci-Korotkoff method (mercury sphygmomanometer) at a physician's office when BP values are equal to or greater than 140/90 mm Hg[2,6]. As the evaluation of persistent hypertension is done on the basis of arterial blood pressure measurements at home or at physician's office (instead of multiple BP measurements taken on several separate occasions over a period of time, for older age groups within 2 or 3 weeks, and for younger age groups with dietary restrictions within a few months), this may cause errors in the hypertension diagnosing which include: false hypertension, white coat hypertension, mask hypertension, alert reaction and the consequential unnecessary and potentially dangerous antihypertensive treatment.

The purpose of the present study was to evaluate whether there is a difference between blood pressure measured in the physician's office and the average 24hr continuous blood pressure in hypertensive patients monitored at the patients' home, and if there is a difference, could it be the result of possible blood pressure response of the patient to the physician known as »white coat effect« or »white coat hypertension«[14–17].

Participants and Methods

The study included 80 outpatients divided in two groups each of 40. A younger age group (26 men and 14 women) and an older age group (21 men and 19 women) with an average age range of the younger group (mean ± SD age, 22.8 ± 1.8 years) and the older group (mean ± SD age, 50.3 ± 5.7 years). The patients consented to the procedure after they were told that their blood pressure was going to be measured using different techniques and all the procedures were explained to them.

They were selected if they had been diagnosed as essential hypertension grade 1, according to 2007 ESH/ESC Guidelines or The USA Joint National Committee Guidelines (JNC 7) (i.e., arterial blood pressure > 140/90 mm Hg and <160/100 mmHg), and without antihypertensive treatment. All participants went through a two-week »wash-out« period without medication.

All patients underwent different clinical examinations essential for this study. Demographic information collected on each patient included sex, age, reported family history of hypertension and risk factors – alcohol consumption, habitual cigarette smoking as well as physical activity. Target organ damage in all patients was clinically evaluated. All patients underwent electrocardiogram and direct fundoscopy. Anthropometric measurements included height and weight and calculation of body mass index (BMI; kg/m^2). Biochemical measurements included total cholesterol, creatinin and blood glucose levels and proteinuria. Arterial blood pressure was measured with a mercury sphygmomanometer three consecutive times in a sitting position after 5 minutes of patient rest. The average of the last two measurements was used in the analysis. Heart rate was also collected. The patients were subsequently fitted with a non-invasive device (SpaceLabs, Medical 90207) for ambulatory blood pressure monitoring, which they wore for the next 24 hours (from 0800 that day until 0800 the next day). The average blood pressure obtained from CABPM of 140 mm Hg for systolic and 90 mm Hg for diastolic blood pressure was defined as hypertension.

The study protocol was approved by the ethics committee of the institutions involved. Statistical analysis was done using SPSS software. Comparison of quantitative values was made using t-test if they did not show significant differences from the average. If the data showed significant differences from average values then the Mann-Whitney test was used. To compare quantitative variables between four groups we used analysis of variance or Kruskal-Wallis test. After analysis of variance, to compare two groups, we further used Tukey HSD test, and after Kruskal-Wallis analysis of variation we used the Mann-Whitney test. The data within each group was analysed using the Wilcoxon test. For qualitative data analysis we used χ^2 test. Only a $p<0.05$ is considered as statistically significant.

Results

The 80 patients examined for this study, were divided in two groups – 40 of them in a younger age group (aged 20 to 25,average 22.8 ± 1.8 years) and 40 in an older age group (aged 40–60 years, average 50,3 ± 5,7). Patients in the younger age group were more physically active (χ^2= 20.05; p<0.001). Patients in the older age group had greater weight (t = 2.880; p=0.0051) and BMI (t = 2.966; p=0.0040). The younger patients had normal electrocardiogram and fundus, while 6 patients in the older age group had electrocardiograms showing signs of left ventricular hypertrophy (χ^2=6.49; p=0.0109) and 13 of them had fundus hypertensive changes (χ^2=15,52; p<0,001). Cholesterol levels in the older age group were significantly higher (t = 3.698; p=0.0004)) and more of the older patients had proteinuria (χ^2=5.46; p=0.0195). The systolic BP in the older age group was higher than in the younger group (t = 2.281; p=0.0252) See Table 2. All other parameters taken were equal for both groups and thus statistical not significant (Table 1 and Table 2).

According to the CABPM readings in our study, 23 patients in the younger age group and 33 patients in the older age group were diagnosed as being hypertensive (χ^2=5.95; p=0.015) (Table 3). The difference between blood pressure values obtained by standard mercury sphygmomanometer and CABPM can be seen by analysing the differences in systolic and diastolic blood pressure (Table 4, Figure 1 and 2).

TABLE 3
THE »TRUE« HYPERTENSION DIAGNOSIS BETWEEN YOUNGER AND OLDER ACCORDING TO CABPM

Hypertension diagnosed by CABP	Participant (n)		
	20–25 years	40–60 years	Total
No	17	7	24
Yes	23	33	56
Total	40	40	80

The difference in systolic blood pressure was significant in the younger age group patients who were excluded from having hypertension by CABPM (26.4 ± 10.1 mm Hg; z=3.6; p<0.001) (Table 1, Figure 1) as well as the difference in diastolic blood pressure (25.2 ± 7.9 mm Hg; z=3.6; p<0.001) (Table 1, Figure 2).

There was a significant differences in systolic blood pressure in patients aged under 40, who were diagnosed by CABPM as having arterial hypertension (18.9 ± 12.5 mm Hg; z=4.1; p<0.001) (Table 4, Figure 1). A minor drop in systolic blood pressure observed among young hypertensive patients by CABPM is of borderline significance (z=1.99; p=0.05) compared to the considerable drop in diastolic blood pressure (z=5.0; p<0.001). CABPM recorded the drop of systolic (30.0 ± 9.6 mm Hg; z=2.37; p=0.018) (Table 4, Figure 1), and diastolic blood

TABLE 1
CHARACTERISTICS OF PARTICIPANTS BEFORE FIRST BLOOD PRESSURE MEASUREMENT

Characteristics	20–25 years	40–60 years	Test; p
Age	22.8 ± 1.8	50.3 ± 5.7	t=29.10; p<0,001
Smonking positive, n	32	25	χ^2=2.99; p=0.0838
Physical activity positive, n	31	11	χ^2=20.05; p<0.001
Weight, kg	74.4 ± 12.2	82.4 ± 12.6	t = 2.880; p=0.0051
Height, cm	173.2 ± 7.9	174.3 ± 6.8	t = 0.667; p=0.5065
BMI, kg/m^2	24.8 ± 3.1	27.1 ± 3.8	t = 2.966; p=0.0040
LVH, n	0	6	χ^2=6.49; p=0.0109
Hypertensive fundus, n	0	13	χ^2=15,52; p<0,001
Creatinin, μmol/L	96.5 ± 19.9	101.7 ± 20.7	t = 1.145; p=0.2556
Cholesterol, mmol/L	5.2 ± 1.4	6.4 ± 1.5	t = 3.698; p=0.0004
Glucose, mmol/L	4.7 ± 0.97	4.64 ± 1.14	t = 0.253; p=0.8005
Proteinuria	2	9	χ^2=5.46; p=0.0195
Heart rate	77.5 ± 8.7	76.9 ± 8.0	t = 0.321; p=0.7490

TABLE 2
BLOOD PRESSURE VALUES MEASURED ACCORDING TO THE RIVA-ROCCI-KOROTKOFF METHOD (MERCURY SPHYGMOMANOMETER) – FIRST MEASUREMENT

Characteristics	20–25 years		
Systolic BP, mm Hg	157.6 ± 13.1	164.5 ± 13.8	t = 2.281; p=0.0252
Diastolic BP, mm Hg	101.6 ± 6.2	101.4 ± 6.6	t = 0.139; p=0.8893

TABLE 4
BLOOD PRESSURE VALUES MEASURED WITH A MERCURY SPHYGMOMANOMETER AND BY ABPM AMONG DIFFERENT GROUPS OF PATIENTS

		Systolic BP*, measured with a mercury sphygmomanometer (mm Hg)	Systolic BP*, measured by CABPM** (mm Hg)	Diastolic BP*, measured with a mercury spygmomanometer (mm Hg)	Diastolic BP*, measured by CABPM** (mm Hg)
Patients, age (years)	Hypertension by CABPM	x ± SD (min-max)	x ± SD (min-max)	x ± SD (min-max)	x ± SD (min-max)
20–25	No (N = 17)	150.3 ± 7.6 (140–160)	123.9 ± 7 (109–138)	100.3 ± 6.7 (90–110)	75.1 ± 7.6 (59–87)
20–25	Yes (N = 23)	163.0 ± 13.8 (140–185)	144.1 ± 11.5 (130–181)	102.6 ± 5.8 (95–110)	95.9 ± 5.9 (90–109)
40–60	No (N = 7)	155.7 ± 10.2 (145–170)	125.7 ± 5.5 (116–133)	99.3 ± 6.1 (95–105)	80 ± 3.9 (74–87)
40–60	Yes (N = 33)	161.1 ± 13.8 (140–185)	153.2 ± 13.2 (121–187)	101.8 ± 6.7 (90–110)	95.7 ± 4.8 (90–107)

* BP = blood pressure (mm Hg) ** CABPM = ambulatory blood pressure monitoring

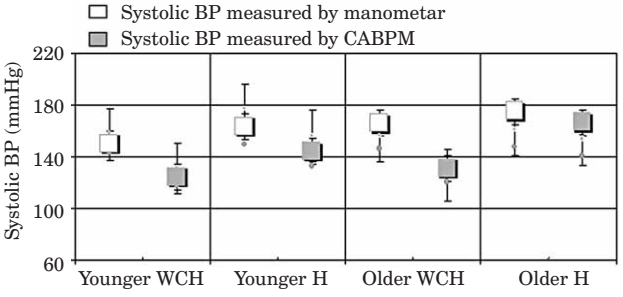

Fig. 1. Systolic arterial blood pressure measured with a mercury sphygmometer and by CABPM (BP = blood pressure, CABPM = ambulatory blood pressure monitoring).

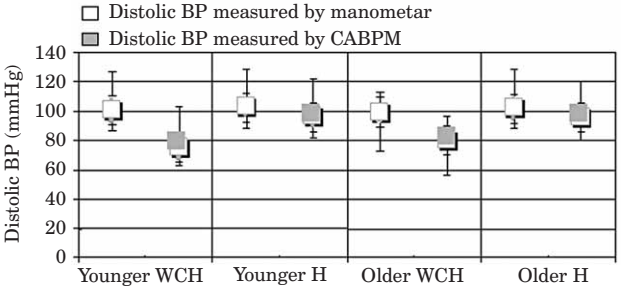

Fig. 2. Dyastolic arterial blood pressure measured with a mercury sphygmomanometer and by CABPM.

pressure (19.3 ± 6.1 mm Hg, z=2.37; p=0.019) (Table 4, Figure 2) in the older age group who were excluded from having arterial hypertension, as well as in those diagnosed as hypertensive. Among those patients the difference in the drop in systolic blood pressure (13.2 ± 16.2 mm Hg; z=3.84; p<0.001) (Table 4, Figure 1) and diastolic blood pressure (6.2 ± 7.2 mm Hg; z=3.84; p<0.001) (Table 4; Figure 2) is less but still statistically significant for systolic (z= 2.5; p=0.012) and for diastolic blood pressure (z=4.5; p=0.001).

Discussion

It is well known that office or clinic blood pressure measurements are performed in inadequate circumstances although the recommendations are that it should be done in a quiet comfortable environment and after a patient has been relaxing for a few minutes[2,6]. These conditions are hard to achieve in clinical practice because patients often wait a long time for a medical examination and they can feel very tense. When they finally reach the physician's office the blood pressure measurement is usually done very quickly and therefore the physician measures a considerably higher blood pressure due to time pressures and a backlog of patients. That can result in elevated blood pressure values up to 27/15 mm Hg and it does not change with repeated measurements [8]. Although arterial hypertension should be diagnosed on the basis of several separate blood pressure measurements over a period of a few weeks, this does not happen. A patient could be diagnosed as hypertensive after only one blood pressure measurement and as a consequence administered antihypertensive medications and ordered to return for a check up within a few months. This could sometimes have unwanted results due to the side effects of precipitate antihypertensive medication as well as the unnecessary cost of testing, cost of treatment, prevalence of white-coat hypertension at baseline, and the varying incidence of new hypertension after the initial screening. The results indicate a potential savings of 3–14% in the cost of care for hypertension and a 10–23% reduction in treatment days where ambulatory blood pressure monitoring is incorporated into the diagnostic process[11,12]. The continuous ambulatory blood pressure monitoring

(CABPM) is indispensable in avoiding hyper diagnosing of arterial hypertension continuous[17–20].

When office blood pressure is persistently elevated and daytime, or 24-hour blood pressure, or home blood pressure, are within their normal range, according to the latest 2007 ESH/ESC Guidelines, this condition is known as »white coat hypertension« (WCH)[14]. Although the more descriptive and less mechanistic term »isolated office (or clinic) hypertension« is preferable because the office ambulatory blood pressure difference does not correlate with the office blood pressure elevation induced by the alerting response to a doctor or a nurse, that is the true »white coat effect«[6].

The rise of the arterial blood pressure above 140/90 mm Hg is noted in the first and last hour of monitoring. The rise of blood pressure is somewhat higher in hypertensive than normotensive patients[16,17].

Clinical studies have shown the prevalence to be 10–20%[15] and can even be up to 60%[22,23] and in this study the prevalence of white coat hypertension is shown to be even greater.

Some studies have tried to establish the correlation between white coat hypertension and metabolic dysfunction (hyperlipidemy?) and obesity[24]. In our study the older group of patients showed statistically greater BMI then the younger group.

It is known that short term physical activity does not have a significant effect on arterial blood pressure within younger normotensive people if measured throughout 24 hours[25,28]. In our study there was a significant difference in the age of the patients and also in changes in electrocardiogram and fundus (atherosclerosis or hypertensive of 1 degree)[26,27]. The results of recent arterial blood pressure measurements indicate that electrocardiogram and echo sonogram of healthy normotensive people and white coat hypertensive does not differ much[27,29.] In some studies, left ventricular hypertrophy reached a proportion of 10%[30]. Because of all these reasons some authors recommend the use of CABPM in all newly diagnosed hypertensive patients[10,14,16,17] and the use of echocardiogram in borderline hypertensives. Unfortunately, this practice is possible only in countries with larger health care budgets than the average[11,31].

The continuous ambulatory blood pressure monitoring revealed that 17 patients of the younger age group (42.5%) who were diagnoses hypertonic according to mercury sphygmomanometeric measurement were normotonic. In the older age group only 7 (17.5%) of participants were normotonic during 24 hr blood pressure monitoring. The proportion of mis-diagnosed normotonic younger patients was directly related to elevated clinic blood pressure, which could be referred to as office hypertension or isolated clinic hypertension (white coat hypertension, was statistically significant (χ^2=5.95; p=0.015).

Similar results to ours were obtained by other authors[13,32,33] but their patients were younger (aged up to 18 years, while our patients had an average age range of, in the younger group (mean ± SD age, 22.8 ± 1.8 years) and in the older group (mean ± SD age, 50.3 ± 5.7 years).

The results obtained from various studies point out the necessity of 24 hour CABPM in the evaluation of white coat hypertension among younger patients[13,32–34]. Some studies have shown that the prevalence of white coat hypertension is more common among borderline and mild hypertensives, and very rare among moderate and severe hypertensive patients[35]. CABPM is useful in the identification of all types of hypertension and it should be routinely used in all patients younger than 30 years having possible hypertension[10,12,36,37].

Conclusion

Hypertension, diagnosed in younger patients only based on several occasionally doctor's office mesuraments using mercury sphygmomanometer, could be mis-interpreted and treated as the start of arterial hypertension. This could sometimes have unwanted results due to the side effects of precipitate antihypertensive medication as well as unnecessary cost of testing, cost of treatment, prevalence of white-coat hypertension at baseline, and varying the incidence of new hypertension after the initial screening. The results indicate a potential savings of 3–14% for the cost of care for hypertension and a 10–23% reduction in treatment days when ambulatory blood pressure monitoring is incorporated into the diagnostic process[11]. Therefore CABPM should be used as a legitimate method in the diagnosing of white coat hypertension, particularly in young age patients. Idetification of white coat hypertensive patients should be followed by a search for metabolic risk or organ damage according to the latest guidelines, and medication should start after an organ damage or cardiovascular risk assesement[2,5,6,26].

REFERENCES

1. ERDINE S, ARI O, ZANCHETTI A, CIFKOVA R, FAGARD R, KJELDSEN S et al, Herz, 31 (2006) 331. — 2. CHOBANIAN AV, BAKRIS GL, BLACK HR, CUSHMAN WC, GREEN LA, IZZO JR JL, JONES DW, MATERSON BJ, OPARIL S, WRIGHT JR JT, ROCCELLA EJ, Hypertension, 42 (2003) 1206. — 3. WHELTON PK Lancet, 344 (1994) 101. — 4. CZARNECKA D, PAWELEC M, KOPACZ E, KLOCH M, Przegl Lek, 63 (2006) 633. (Polish). — 5. PALMAS W, PICKERING T, EIMICKE JP, MORAN A, TERESI J, SCHWARTZ JE, FIELD L, WEINSTOCK RS, SHEA S, Am J Hypertens, 20 (2007) 493. — 6. MANCIA G, DE BACKER G, DOMINICZAK A, CIFKOVA R, FAGARD R, GERMANO G, GRASSI G, HEAGERTY AM, KJELDSEN SE et al, Eur Heart J, 25 (2007) 1105. — 7. BAUMGARTEN P, KAMP J, Blood Pressure Monitoring 3(1988) 303. — 8. MANCIA G, PARATI G, Am Heart J, 116 (1988)1134. — 9. VERDECCHIA P, PORCELLATI C, SCHILLACI G, BORGIONI C, CIUCCI A, BATTISTELLI M, GUERRIERI M, GATTESCHI C, ZAMPI I, SANTUCCI A, SANTUCCI C, REBOLDI G, Hypertension, 24 (1994) 793. — 10. WHITE WB, Hypertension 47 (2006) 14. — 11. KRAKOFF LR, Hypertension, 47 (2006)29. — 12. CHAVANU K, MERKEL J, QUAN AM, Am J Health Syst Pharm, 65 (2008) 209. — 13. PARENICA J, KUBECOVA L, SPINAR J, NEMCOVA H, Vnitr Lek, 47 (2001)856. — 14. PICKERING TG, COATS A, MALLION JM, MANCIA G, VERDECCHIA P, Blood Pressure Monitoring, 4 (1999)333. — 15. VERDECCHIA P, SCHILLACI G,

BORDINI F, ZAMPI I, PORCELLATI C, Hypertension, 20 (1992)555. — 16. OWENS P, ATKINS N, O'BRIEN E, Hypertension, 34 (1999)267. — 17. VERDECCHIA P, STAESSEN J, WHITE WB, IMAI Y, O'BRIEN E, Eur Heart J, 23 (2002)106. — 18. DAWES MG, BARTLETT G, COATS AJ, JUSZCZAK E, Ann Fam Med, 6 (2008) 390. — 19. OGEDEGBE G, PICKERING TG, CLEMOW L, CHAPLIN W, SPRUILL TM, ALBANESE GM, EGUCHI K, BURG M, GERIN W, Arch Intern Med, 168 (2008) 24595. — 20. IHM SH, YOUN HJ, PARK CS, KIM HY, CHANG K, SEUNG KB, KIM JH, CHOI KB, Circ J, 73 (2009) 100. — 21. KRAMER CK, LEITÃO CB, CANANI LH, GROSS JL, Diabetes Care, 31 (2008) 2233. — 22. SELENTA C, HOGAN BE, LINDEN W, Arch Fam Med, 9 (2000) 533. — 23. MACDONALD MB, LAING GP, WILSON MP, WILSON TW, Can Med Assoc J, 161 (1999) 265. — 24. HELVACI MR, KAYA H, YALCIN A, KUVANDIK G, Int Heart J, 48 (2007)605. — 25. LEARY AC, DONNAN PT, MACDONALD TM, MURPHY MB, Blood pressure monitoring, 7 (2002) 209. — 26. KARTER Y, CURGUNLU A, ALTINISIK S et al., Blood Press, 12 (2003)307. — 27. NAKASHIMA T, YAMANO S, SASAKI R et al., Hypertens Res, 27 (2004)739. — 28. ROLTSCH MH, MENDEZ T, WILUND KR, HAGBERG JM, Med Sci Sports Exerc, 33 (2001) 881. — 29. SPENCE JD, BASS M, ROBINSON HC, CHEUNG H, L MELENDEZ J, ARNOLD JM, MANUCK SB, Clin Invest Med, 14 (1991) 241. — 30. MUSCHOLL MW, HENSE HW, BROCKEL U, DORING A, RIEGGER GA, SCHUNKERT H, BMJ, 317 (1998) 565. — 31. LANG S, Croat Med J, 42 (2001) 956. — 32. STERGIOU GS, YIANNES NJ, RARRA VC, ALAMARA CV, Blood Pressure Monitoring, 10 (2005) 297. — 33. ROBLES NR, DOMINIGUEZ TM, CANCHO B, SANCHEZ CE, An Med Interna, 18 (2001)305. — 34. WHITE WB, Am J Med, 121 (2008) S2. — 35. CLEMENT DL., DE BUYZERE M L, DE BACQUER DA, DE LEEUW PW, N Engl J Med, 348 (2003) 2407. — 36. HANSEN TW, JEPPESEN J, RASMUSSEN S et al., Hypertension, 45 (2005) 499. — 37. FAGARD RH, CORNELISSEN VA, J. Hypertens., 25 (2007) 2193.

B. Korljan Babić

Clinic of Internal Medicine, University Hospital Centre »Split«, Šoltanska 1, 21000 Split, Croatia

RAZLIKA IZMEĐU ARTERIJSKOG TLAKA HIPERTENZIVNIH BOLESNIKA MJERENOG U LIJEČNIČKOJ ORDINACIJI I PROSJEČNOG KONTINUIRANOG 24-SATNOG ARTERIJSKOG TLAKA MJERENOG KOD KUĆE

S A Ž E T A K

Cilj istraživanja bio je utvrditi postoji li razlika između arterijskog tlaka hipertenzivnih bolesnika mjerenog u liječničkoj ordinaciji i prosječnog kontinuiranog 24-h arterijskog tlaka mjerenog kod kuće. Ukoliko doista razlika postoji, daljni cilj nam je bio utvrditi da li je ona posljedica tzv. »hipertenzije bijelog ogrtača«, odnosno »učinak bijelog ogrtača«. U istraživanje je bilo uključeno 80 hipertoničara, podijeljeno u dvije grupe (40 bolesnika u svakoj mlađa dobna skupina (26 muškaraca, 14 žena), i starija dobna skupina (21 muškaraca, 19 žena), prosječne dobi mlađe skupine (22,8 ± 1,8 god.) i starije dobne skupine (50,3 ± 5,7 god). Bolesnici su uključeni ukoliko im je dijagnosticirana esencijalna hipertenzija 1. stupnja prema 2007 ESH/ESC smjernicama, odnosno smjernicama The USA Joint National Committee Guidelines (JNC 7, a njih 35 nije liječeno antihipertenzivima. Svi sudionici prošli su dvotjedno razdoblje bez medikamentozne terapije. Najprije je arterijski tlak mjeren živinim manometrom, nakon 5 minuta mirovanja, sjedeći, a u analizu je uzeta prosječna vrijednost dva posljednja mjerenja, nakon čega je bolesnicima postavljen uređaj za kontinuirano mjerenje arterijskog tlaka (SpaceLabs 90207 device). Kontinuirano mjerenje arterijskog tlaka pokazalo je da 17 bolesnika mlađe dobne skupine (42,5%), koji su temeljem mjerenja živinim manometrom proglašeni hipertoničarima, su zapravo normotonični. U starijoj skupini samo je 7 (17,5%) bilo normotonično tijekom kontinuiranog mjerenja arterijskog tlaka. Statistički je bio značajan udio normotenzivnih prema kontinuiranom mjerenje arterijskog tlaka, a koji su ranije proglašeni hipertenzivnim, bolesnika (χ^2=5,95; p=0,015), što je povezano direktno sa povišenim kliničkim arterijskim tlakom, a isto može predstavljati izoliranu klinički hipertenziju, odnosno hipertenziju bijelog ogrtača. Povremena mjerenja arterijskog tlaka standarnom metodom, u ordinaciji, osobito u mlađih osoba, često mogu dovesti do pogrešne interpretacije rezultata i postavljanja dijagnoze hipertenzije, što kao rezultat ima nepotrebno preuranjeno uvođenje antihipertenzivne terapije, štetne ili neželjene posljedice primjene istih, a također dovodi do nepotrebne primjene medicinskih pretraga, troška,u osnovi i do pogrešnog podatka o prevalenciji hipertenzije bijelog ogrtača. Dosadašnja istraživanja pokazala su da je moguća ušteda 3–14% troškova liječenja hipertenzije i oko 10–23% smanjenja medikamentoznih dana u bolesnika kod kojih je primjenjeno kontinuirano mjerenje arterijskog tlaka u dijagnostičke svrhe[11]. Stoga kontinuirano mjerenje arterijskog tlaka treba koristiti kao nužnu metodu u dijagnosticiranju hipertenzije bijelog ogrtača, osobito u mlađih osoba. Po otkrivanju hipertenzije bijelog ogrtača potrebno je procijeniti metabolički rizike, kao i stupanj oštećenja organa, a liječenje je potrebno započeti po otkrivanju istih, odnosno prema procijeni kardiovaskularnog rizika[2,5,6].