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Association of Inter-arm Blood Pressure Difference with Atherosclerosis in Patients without Cardiovascular Diseases

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ABSTRACT

Background: Previous studies showed that great difference of inter-arm blood pressure (IABP) was associated with adverse cardiovascular outcomes. However, these studies had measurement bias because blood pressure (BP) was measured sequentially for each arm. Then, the aim of present study, using simultaneous BP measurement, is to investigate the association between ankle brachial index (ABI), brachial ankle pulse wave velocity (baPWV) and IABP difference in patients without cardiovascular disease. **Methods:** We conducted cross sectional study from medical data and selected 153 (116 men, 37 women) patients aged 18 years or older. Simultaneous BP measurements were recorded using automatic oscillometric monitor equipped with dual arm cuffs in both arms. At the same day, ABI, baPWV, and physical parameters were evaluated. **Results:** The mean age of the subjects was 52.8 ± 9.9 and the difference of inter-arm systolic BP (SBP) and diastolic BP (DBP) were 5.6 ± 4.3 and 4.5 ± 3.7 mm Hg. Compared with group with an inter-arm SBP difference less than 5 mm Hg, group with an inter-arm SBP difference more than 5 mm Hg was more older (p = 0.012), more higher proportion of patient whose left arm SBP was higher than right (p = 0.004), higher left arm SBP (p = 0.044) and higher baPWV (p = 0.025). However, the difference of IABP in SBP and DBP had no significant correlation with the age (r = 0.152, p = 0.06 and r = 0.03, p = 0.715), ABI (r = 0.021, p = 0.801 and r = 0.131, p = 0.105) and baPWV (r = 0.115, p = 0.158 and r = 0.068, p = 0.403). **Conclusions:** There were no significant correlation between the differences of IABP in simultaneous BP measurements and ABI, baPWV.

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Key Words: Blood pressure determination; Ankle-brachial index; Pulse wave velocity

Introduction

Blood pressure (BP) measurement is the most common investigation performed in primary care.[1)] Precise monitor of BP is important for early detection, treatment, prevention of hypertension.[2)] However, patients are often encountered in the clinical setting with a different systolic BP (SBP) or diastolic BP (DBP) in each arm. The presence of difference between arm BP can result in a delayed di-

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agnosis of hypertension[3] and is associated with poor control of BP, because failure to measurement to the arm with the higher value can mislead decisions about management. Currently guidelines, the American Heart Association and the Korean hypertension Association recommended that BP should initially be measured in both arms for identifying upper-extremity arterial obstruction and coarctation of the aorta.[4,5] If there was a difference in BP, an arm with higher values should be used for BP measurements.

However, this recommendation has not been followed by many clinicians, because lack of sphygmomanometer that can measure bilateral brachial BP at the same time. Most primary clinic has used unilateral automatic sphygmomanometer for BP monitoring. Then, which arm should patients put in the sphygmomanometer?

Meanwhile, ankle-brachial pressure index measurement has been routinely used as a screening test for the non-invasive assessment of peripheral vascular disease (PVD),[6] and a lower ankle-brachial index (ABI) has been reported to identify this condition in both clinical practice and epidemiologic studies.[7] Also brachial-ankle pulse wave velocity (baPWV) was useful to screen the arterial stiffness[8] and high baPWV value showed strong powers in predicting the mortality, cardiovascular event.[9,10] However it is not routinely undertaken in primary practice assessment because of time consuming, need of specialized equipment and degree of training.

Previous study of primary care patients proposed that the difference of inter-arm BP (IABP) may be caused by PVD and presence of the inter-arm difference (IAD) may have a prognostic value in predicting cardiovascular events.[11,12]

If there is association between ABI and IABP, measurement of IABP could have value in providing a simple screening test to apply in primary clinic to identify patients at the highest risk of cardiovascular disease (CVD) and therefore in need of early assessment. Previous studies showed that the difference of IABP was associated with ABI[13] and cardiovascular adverse outcomes. However they had measurement bias because BP was measured sequentially for each arm. Recently a domestic study[14] estimated the IABP by simultaneously measuring the both arms BP using an automatic electronic sphygmomanometer. However, they did not assess ABI and baPWV. Accordingly, the objective of present study, using simultaneous BP measurement, was to compare the ABI, baPWV between patients with and without an IABP difference and to identify the independent factors associated with an IABP difference.

Subjects and methods

This study was conducted in patients aged 18 years or older who visited the outpatient clinic of the department of family medicine of Pusan National University Hospital. The both arm BP have been simultaneously examined all patients visited the outpatient clinic of the department of family medicine of Pusan National University Hospital. Patients were eligible if they were carried ABI, baPWV, and the both arm BP at the same day. We excluded participants by criteria as follows: 1) patients with stroke or ischemic heart disease; 2) patients with significant vascular diseases such as aortic aneurysm or subclavian steal syndrome; 3) patients who had receiving cardiovascular stenting or bypass surgery; 4) patients who had an arrhythmia or valvular heart disease; 5) patients who had injury, surgery or paralysis of arm; 6) patients who were receiving hemodialysis on the arm; and 7) patients who were measured ABI, baPWV, and the both arm BP at the other day. We recorded the participant's past history (cerebrovascular events and cardiovascular events such as myocardial infarction and angina) and characteristics (age, sex, smoking status, alcohol habit, exercise, and body mass index [BMI]).

In addition, information regarding medications such as

antihypertensive drugs, oral hypoglycemic agent, insulin, and 3-hydroxy-methyl glutaryl-coenzyme A reductase inhibitors (statins) was obtained from medical records and interviews with patients. Subjects were defined as having hypertension, diabetes and hyperlipidemia if treatment medications were prescribed. This study protocol was approved by the institutional review board of the Pusan National University Hospital (E-2013019).

1. Measurements

In our study, the both arm BP measurements were done simultaneously using an oscillometric automatic device equipped with two cuffs (EX PLUS 1300; Jawon Medical, Gyeongsan, Korea) in sitting position (Fig. 1). The SBP and DBP were checked twice in both arms and recorded by the average. All patients were refrained from caffeine intake and smoking for more than one hour before the test. If there was a difference of more than 5 mm Hg in BP between both arms, BP was rechecked twice in both arms after five minutes.

At the same day, the ABI and baPWV were tested using an ABI/PWV-form device (VP-1000 plus; Colin Co., Komaki, Japan) that can simultaneously measure BP in both arms and ankles by an oscillometric method in the supine position.

Fig. 1. Simultaneous blood pressure measurements using automatic double arm blood pressure monitor.

This device can automatically calculate the ABI and record baPWV by sensor in the four cuffs. BP monitoring cuffs were wrapped around the both sides of the upper and lower extremities. After obtaining bilateral ABI and baPWV values, we used a mean right/left ABI and baPWV as representative for each subject. The ABI and baPWV tests were checked once in each patient. The BMI was calculated as the ratio of weight in kilograms divided by square of height in meters. We collected data from 15 November 2012 until 15 April 2013.

2. Statistical analysis

As the both arm BP were examined twice and averaged, the mean values of BP were obtained. Data are expressed as percentages or mean ± standard deviation. To compare clinical characteristics including SBP, DBP, and physical measurements between men and women, we used independent t-test. Moreover, when comparing medical history and health related habits between the two sexes, we conducted a chi-square test. Subjects were divided 2 groups as IAD $\geq$ 5 and IAD $<$ 5 and the differences between groups were checked by chi-square test for categorical variables or by independent t-test for continuous variables. In addition, to identify correlations between the difference of IABP, ABI, and baPWV, Pearson's correlation coefficients was used. Statistical analysis was carried out using PASW SPSS ver. 18.0 (SPSS Inc., Chicago, IL, USA). If p-value was less than 0.05, difference was considered statistically significant.

Results

1. Baseline characteristics of subjects

The mean age of the 153 patients was 52.8 ± 9.9 years. Sixty percent of total patients had higher SBP in the left arm and fifty-one percent of total patients had higher DBP in the left arm. The mean IAD of the patients was 5.6 ± 4.3 mm Hg

in SBP and 4.5 ± 3.7 mm Hg in DBP. There were 46.4% of patients with the IAD in SBP of < 5 mm Hg, 32.7% with the 5 ≤ IAD < 10 mm Hg, 17.6% with the 10 ≤ IAD < 15 mm, 2.6% with the 15 ≤ IAD 20 mm Hg, 0.7% with the ≥ 20 mm Hg. There were 58.2% of patients with the IAD in DBP of < 5 mm Hg, 34.6% with the 5 ≤ IAD < 10 mm Hg, 5.2% with the 10 ≤ IAD < 15 mm, 1.3% with the 15 ≤ IAD 20 mm Hg, 0.7% with the ≥ 20 mm Hg.

2. Comparison of clinical characteristics between men and female

The mean age was 52.5 ± 9.8 years in men and 53.8 ± 10.5 years in women. The differences between men and women were shown in Table 1.

In women, the prevalence of inter-arm SBP difference ≥ 5 mm Hg was higher (48.3% in men and 70.3% in women). Compared with women, men were found to have more regular exercise habit (47.4% and 24.3%, p = 0.013), higher DBP in the left arm (77.7 ± 12.2 mm Hg and 73.9 ± 8.6, p = 0.043), lower IAD in SBP (5.0 ± 4.0 mm Hg and 7.6 ± 4.6 mm Hg, p = 0.001), lower prevalence of IAD in SBP ≥ 5 mm Hg (48.3% and 70.3%, p = 0.019).

Table 1. Baseline clinical characteristics of the study subjects (n = 153)

Characteristic	Male (n = 116)	Female (n = 37)	p-value
Age (yr)	52.5 ± 9.8	53.8 ± 10.5	0.49
Hypertension	58 (50)	19 (51.4)	0.886
Diabetes mellitus	24 (20.7)	5 (13.5)	0.332
Hyperlipidemia	80 (69)	28 (75.7)	0.435
Current smoking	45 (38.8)	9 (24.3)	0.109
Alcohol intake	68 (58.6)	17 (45.9)	0.177
Regular exercise >150 min/wk	55 (47.4)	9 (24.3)	0.013*
Body mass index (kg/m^2)	25.2 ± 2.7	24.5 ± 3.4	0.22
Left SBP (mm Hg)	128.7 ± 14.2	128.7 ± 12.5	0.98
Left DBP (mm Hg)	77.7 ± 12.2	73.9 ± 8.6	0.043†
Right SBP (mm Hg)	126.9 ± 13.4	124.6 ± 9.3	0.35
Right DBP (mm Hg)	77.6 ± 12.2	73.7 ± 9.3	0.081
Left SBP (mm Hg) > right SBP (mm Hg)	74 (63.8)	27 (73)	0.462
Left DBP (mm Hg)> right DBP (mmHg)	60 (51.7)	18 (48.6)	0.668
Mean inter-arm difference in SBP ≥ 5 (mm Hg)	56 (48.3)	26 (70.3)	0.019*
Mean inter-arm difference in DBP ≥ 5 (mm Hg)	50 (45.7)	16(35.1)	0.259
Mean inter-arm difference in DBP ≥ 5 (mm Hg)	5.0 ± 4.0	7.6 ± 4.6	0.001†
Mean inter-arm difference in DBP ≥ 5 (mm Hg)	4.8 ± 4.1	3.9 ± 2.4	0.232
Heart rate	76.8 ± 12.0	73.7 ± 11.4	0.171
Right baPWV (cm/sec)	1,450.6 ± 223.1	1,509.5 ± 317.1	0.211
Left baPWV (cm/sec)	1,423.3 ± 255.2	1,497 ± 301.2	0.145
Right ankle-brachial index	1.20 ± 0.12	1.18 ± 0.13	0.528
Left ankle-brachial index	1.19 ± 0.13	1.16 ± 0.11	0.345
Mean baPWV (cm/sec)	1,436.9 ± 230.5	1,503.3 ± 306.4	0.163
Mean ankle-brachial index	1.19 ± 0.12	1.17 ± 0.11	0.38

Values are presented as mean ± standard deviation or number (%). p < 0.05.
SBP, systolic blood pressure; DBP, diastolic blood pressure; baPWV, brachial-ankle pulse wave velocity.
*By chi-square test. †By independent-test.

Table 2. Comparison of groups with and without in systolic blood pressure between arms 5 mm Hg or more

Variable	Mean interarn difference in SBP < 5 (n = 71)	Mean interarn difference in SBP ≥ 5 (n = 82)	p-value
Age (yr)	50.6 ± 9.8	54.6 ± 9.8	0.012*
Male	60 (84.5)	56 (68.3)	0.019†
Hypertension	30 (42.3)	47 (57.3)	0.063
Diabetes mellitus	12 (16.9)	17 (20.7)	0.547
Hyperlipidemia	47 (66.2)	61 (74.4)	0.267
Current smoking	29 (40.8)	25 (30.5)	0.181
Alcohol intake	42 (59.2)	43 (52.4)	0.404
Regular exercise > 150 min/wk	26 (36.6)	38 (46.3)	0.224
Body mass index (kg/m^2)	25.1 ± 3.1	25.0 ± 2.7	0.804
Left SBP (mm Hg)	126.3 ± 12.2	130.8 ± 14.8	0.044*
Left DBP (mm Hg)	77.0 ± 11.2	76.7 ± 11.8	0.873
Right SBP (mm Hg)	125.5 ± 12.0	127.2 ± 13.8	0.416
Right DBP (mm Hg)	77.1 ± 11.2	76.3 ± 12.1	0.678
Mean SBP (mm Hg)	125.09 ± 12.0	129.0 ± 13.6	0.139
Mean DBP (mm Hg)	77.0 ± 10.8	76.5 ± 11.6	0.765
Left SBP (mm Hg) > right SBP (mm Hg)	44 (62)	57 (69.5)	0.004†
Left DBP (mm Hg) > right DBP (mm Hg)	39 (54.9)	39 (47.6)	0.560
Mean inter-arm difference in DBP (mm Hg)	4.2 ± 4.2	4.8 ± 3.3	0.337
Heart rate	76 ± 11.1	76 ± 12.7	0.965
Right baPWV (cm/sec)	1,414.4 ± 194.1	1,508.5 ± 282.6	0.019*
Left baPWV (cm/sec)	1,394.2 ± 193.7	1,481.7 ± 314.0	0.043*
Right ankle-brachial index	1.2 ± 0.1	1.2 ± 0.1	0.954
Left ankle-brachial index	1.17 ± 0.1	1.19 ± 0.1	0.494
Mean baPWV (cm/sec)	1,404.3 ± 189.5	1,495.1 ± 289.4	0.025*
Mean ankle-brachial index	1.18 ± 0.1	1.19 ± 0.1	0.72

Values are presented as mean ± standard deviation or number (%). $p < 0.05$.
SBP, systolic blood pressure; DBP, diastolic blood pressure; baPWV, brachial-ankle pulse wave velocity.
*By independent t-test. †By chi-square test.

3. Comparison of groups with and without in diastolic blood pressure between arms 5 mm Hg or more

Compared with group with an inter-arm SBP difference less than 5 mm Hg, group with an inter-arm SBP difference more than 5 mm Hg were more older (50.6 ± 9.8 years and 54.6 ± 9.8 years, p = 0.012), higher proportion of patient whose left arm SBP was higher than right (62% and 69.5%, p = 0.004), higher left arm SBP (126.3 ± 12.2 mm Hg and 130.8 ± 14.8 mm Hg, p = 0.044), higher mean baPWV (1,404.3 ± 189.5 and 1,495.1 ± 289.4, p = 0.025) (Table 2). In DBP, group with an inter-arm DBP difference more than 5 mm Hg was shown to be higher proportion of patient whose left arm DBP was higher than right (46% and 57.6%, p = 0.002), higher the difference of IABP in SBP (4.6 ± 3.6 mm Hg and 6.9 ± 4.8 mm Hg, p = 0.003) (Table 3).

4. Correlation between the inter-arm blood pressure difference and mean ankle-brachial index, mean brachial-ankle pulse wave velocity

In the correlation analysis, an inter-arm SBP difference was not found to be significantly associated with age (r = 0.152, p = 0.06), mean SBP (r = 0.113, p = 0.165),

Table 3. Comparison of groups with and without in DBP between arms 5 mm Hg or more

Variable	Mean inter-arm difference in DBP < 5 (n = 87)	Mean inter-arm difference in DBP ≥ 5 (n = 66)	p-value
Age (yr)	53.0 ± 9.7	52.5 ± 10.4	0.728
Male	63 (72.4)	53 (80.3)	0.259
Hypertension	41 (47.1)	36 (54.5)	0.363
Diabetes mellitus	15 (17.2)	14 (21.2)	0.535
Hyperlipidemia	57 (65.5)	51 (77.3)	0.114
Current smoking	30 (34.5)	24 (36.4)	0.809
Alcohol intake	45 (51.7)	40 (36.7)	0.274
Regular exercise > 150 min/wk	39 (44.8)	25 (37.9)	0.388
Body mass index (kg/m^2)	25.0 ± 2.9	25.0 ± 2.8	0.992
Left SBP (mm Hg)	127.9 ± 12.2	130.0 ± 15.8	0.400
Left DBP (mm Hg)	75.9 ± 10.5	78.0 ± 13.3	0.249
Right SBP (mm Hg)	126.3 ± 12.4	126.6 ± 13.8	0.885
Right DBP (mm Hg)	75.7 ± 10.2	78.0 ± 13.3	0.252
Mean SBP (mm Hg)	127.1 ± 12.0	128.2 ± 14.3	0.603
Mean DBP (mm Hg)	75.8 ± 10.3	78.0 ± 12.3	0.225
Left SBP (mm Hg) > right SBP (mm Hg)	56 (64.4)	45 (68.2)	0.793
Left DBP (mm Hg) > right DBP (mm Hg)	40 (46)	38 (57.6)	0.003*
Mean inter-arm difference in DBP (mm Hg)	4 .6 ± 3.6	6.9 ± 4.8	0.002†
Heart rate	75.5 ± 11.5	76.8 ± 12.5	0.513
Right baPWV (cm/sec)	1,461.5 ± 204.1	1,469.2 ± 300.2	0.851
Left baPWV (cm/sec)	,445.7 ± 202.1	1,435.0 ± 337.2	0.808
Right ankle-brachial index	1.2 ± 0.1	1.18 ± 0.1	0.516
Left ankle-brachial index	1.18 ± 0.1	1.19 ± 0.1	0.606
Mean baPWV (cm/sec)	1453.6 ± 200.1	1,452.1 ± 308.1	0.971
Mean ankle-brachial index	1.19 ± 0.1	1.19 ± 0.1	0.958

Values are presented as mean ± standard deviation or number (%). $p < 0.05$.
SBP, systolic blood pressure; DBP, diastolic blood pressure; baPWV, brachial-ankle pulse wave velocity.
*By chi-square test. †By independent-test.

Table 4. Correlation between mean inter-arm difference in BP and ABI, baPWV, and other variables

Variable	Mean inter-arm difference in SBP (mm Hg)		Mean inter-arm difference in DBP (mm Hg)	
	Correlation coefficient (r)	p-value	Correlation coefficient (r)	p-value*
Age	0.152	0.060	0.030	0.715
Mean SBP	0.113	0.165	0.023	0.780
Mean DBP	0.019	0.813	0.086	0.291
Mean ABI	0.021	0.801	0.131	0.105
Mean baPWV	0.115	0.158	0.068	0.403

ABI, ankle-brachial pressure index; SBP, systolic blood pressure; DBP, diastolic blood pressure; baPWV, brachial-ankle pulse wave velocity.
*By Pearson's correlation analysis.

mean DBP (r = 0.019, p = 0.813), mean ABI (r = 0.021, p = 0.801), mean baPWV (r = 0.115, p = 0.158). Also an inter-arm DBP difference was not shown to be significantly associated with age (r = 0.03, p = 0.715), mean SBP (r = 0.023, p = 0.780), mean DBP (r = 0.086, p = 0.219), mean ABI (r = 0.131, p = 0.105), mean baPWV

(r = 0.068, p = 0.403) (Table 4).

Discussion

We investigated the association between the differences of IABP, simultaneously measured in both arm and ABI, PWV or cardiovascular risk factors. In our study, more than half of the patients, the IAD of SBP were more than 5 mm Hg and about 20.9% (SBP) and 7.2% (DBP) of the patients, the IAD of BP were more than 10 mm Hg. These results were similar to that of the study by Clark et al.[15] (19% in SBP and 7% in DBP). But the differences were reported widely from 1.4% to 39%[16,17,18] according to the studies. Right arm BP was significantly higher than left in our study and these results consistent with earlier studies,[19,20] but several studies reported opposite results.[16,21] However, most studies reported that right or left handedness was not related to the differences of IABP.[17,22,23] These different results between studies may be due to the diversity of methodology. They measured BP sequentially rather than simultaneously, used mercury sphygmomanometers and inter-observer variability also may influence the results. Regarding to the handedness, theoretically, if the muscles in dominant arm are more developed, it might take more pressure in the right arm cuff to overcome tissue inertia. Hence, in right handed people, BP in the right arm might be measured slightly higher than the left arm. In contrast, higher BP in the left arm might be explained that the arteries of the left arm are closer to the heart, which sometimes causes a difference. Namely, respective small differences of anatomical structures and hemodynamic profiles might influence the bilateral BP disparity. In addition, we revealed that advanced age, higher left arm SBP, high baPWV were associated with an inter-arm SBP difference of 5 mm Hg or more. Su et al.[13] had shown that inter-arm SBP difference was associated with female gender, hypertension, high BMI, ABI < 0.9, and high baPWV. Their findings were consistent with our study results that female gender, high baPWV were correlated with inter-arm SBP difference. In studies with Kimura[19] and Lane,[16] gender was not a significant factor of inter-arm SBP difference. However, our study showed that female gender was one of factors for an inter-arm SBP difference of 5 mm Hg or more. More elderly and hyperlipidemic female patients were enrolled in our study and these differences might influence the results. Further studies are necessary to identify the association and possible mechanisms between inter-arm SBP difference and female gender. Also, our study found that group with an inter-arm SBP difference 5 mm Hg or more showed higher baPWV than group with an inter-arm SBP difference less than 5 mm Hg. Arterial stiffness plays an important role in the atherosclerotic process and can be estimated non-invasively with PWV[24,25] and higher PWV has been accepted as a predictor of CVD. Therefore, these finding suggested that inter-arm SBP difference might be used as an important potential marker of CVD. But there were no reports about the quantitative correlation between the differences of simultaneously measured IABP and ABI or baPWV. In contrast with our results, some studies[2,15,19] showed that low ABI, ABI less than 0.9, or high baPWV was correlated with inter-arm SBP difference. These results might be due to the prevalence of patients in our study that the number of patient with ABI less than 1.0 was very low (no patients with ABI less than 0.9) and PWV was relatively lower than earlier studies.[14,26]

Our study has some limitations. First, regional variations cannot be excluded since we selected subjects who visited outpatient clinic of local university hospital and then, our study results cannot be generalized to all Korean population. Second, the number of enrolled pa-

tients was too small. Third, as a cross-sectional study, it had limitation to reveal relations among variables. Forth, information about right or left handedness was not obtained. However, Kim et al.[25] reported that IABP was not related with right or left handedness.

Previous studies measured BP sequentially rather than simultaneously and used different methods with various measuring instruments, they could not reflect real difference of IABP. Whereas, in ours study, we measured both arm BP simultaneously with a use of automatic sphygmomanometers, which might reflect the real IABP difference. Lohmann et al.[26] reported that simultaneously measured BP for both arms with automatic device were more accurate than sequentially and manually measured BP for each arm in subjects with cardiovascular risk factors.

In conclusion, we can screen the patients at risk of atherosclerosis with a use of inter-arm SBP and DBP differences in primary practice. And then, in primary care, bilateral BP measurements should be applied as a routine assessment to measure the BP.

Summary

연구배경: 양팔 간의 혈압 차이가 동맥경화도 및 심혈관질환 위험도와 관련이 있다고 알려져 있지만 이제까지의 연구들은 양팔의 혈압을 동시에 측정하지 않아 실제 양팔 혈압의 차이를 반영하는 데 한계가 있다. 이에 본 연구는 양팔의 혈압을 동시에 잴 수 있는 측정기기를 이용하여 양팔의 혈압 차이와 ankle brachial index (ABI), brachial ankle pulse wave velocity (baPWV)와의 연관성을 알아보고자 하였다.

방법: 부산대학교병원 가정의학과 외래를 방문했던 18세 이상의 남자 116명, 여자 37명의 병원기록을 분석하였다. 대상자는 양팔의 혈압을 측정한 같은 날 ABI와 baPWV를 검사하였던 사람들로 이 중 심혈관질환이나 상완의 손상, 의미 있는 판막질환, 부정맥, 말초혈관질환을 가진 사람들은 제외하였다. 양팔 혈압은 자동화혈압계를 이용하여 동시에 측정하였고, 이외 신체계측과 병력을 조사하였다. 양팔 혈압의 차이 5 mm Hg를 기준으로 두 그룹으로 분류하여 여러 인자들을 비교하였고 혈압 차이와 ABI, baPWV 간의 상관관계를 분석하였다.

결과: 대상자의 평균 연령은 52.8 ± 9.9세이며 양팔 혈압의 차이는 수축기에서 5.6 ± 4.3 mm Hg, 이완기에서 4.5 ± 3.7 mm Hg이었다. 양팔 간 수축기혈압이 5 mm Hg 이상인 경우 그렇지 않은 경우에 비하여 나이가 많았고($p = 0.012$), 왼쪽의 수축기혈압이 오른쪽보다 높은 사람의 비율이 많았으며($p = 0.004$), 왼쪽의 수축기혈압이 높았고($p = 0.044$), baPWV가 유의하게 높았다($p = 0.025$). 하지만 수축기 또는 이완기 양팔 혈압 차이와 나이($r = 0.152$, $p = 0.06$ and $r = 0.03$, $p = 0.715$), ABI ($r = 0.021$, $p = 0.801$ and $r = 0.131$, $p = 0.105$), baPWV ($r = 0.115$, $p = 0.158$ and $r = 0.068$, $p = 0.403$) 간의 상관관계는 보이지 않았다.

결론: 심혈관질환이 없는 비교적 건강한 성인의 반수 이상에서 5 mm Hg 이상의 양팔 간의 혈압 차이를 보였지만, 양팔 혈압의 차이와 ABI, baPWV 간의 의미 있는 상관관계를 보이지는 않았다.

Conflict of interest

No potential conflict of interest relevant to this article was reported.

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