

Physician's Awareness and Education for Patient on Life Style Modification and Home Blood Pressure Monitoring Recommended in Hypertension Guideline

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ABSTRACT

Background: It is important to understand physicians' awareness and knowledge on hypertension guideline to comprehend physician oriented barrier against proper hypertension management. Current guidelines emphasize on the role of home blood pressure monitoring. The aim of this study is to investigate the level of awareness and knowledge of Korean physicians on home blood pressure monitoring recommended in current guideline. **Methods:** A questionnaire survey asking home blood pressure measurement, as well as prehypertension and life style modification, was conducted among 36 primary physicians and 25 residents of a tertiary medical center. **Results:** Except the limitation alcohol intake (80.3%), the physicians demonstrated above 90% of agreement with other contents of life style modification recommended by published guidelines (salt restriction, stop smoking, weight loss, and regular aerobic exercise). Majority (77.7%) of primary physicians recommend home blood pressure measurement to their patients. Significantly primary physicians were likely to recommend home blood pressure monitoring than residents (48% vs. 77.7%, $p = 0.027$). But both physicians and residents show poor compliance to home blood pressure monitoring guideline in the point of blood pressure measuring (12% vs. 19.4%, $p > 0.05$). But most of participants are aware of adverse effect of prehypertension (88.5%) and the need of its treatment (96.7%). **Conclusions:** This result suggest screening alcohol use disorder and brief counseling by physicians should be encouraged as a part of hypertension management and promoting physicians to equip the correct knowledge of home blood pressure measuring recommended in guideline is warranted. (J Korean Soc Hypertens 2012;18(3):97-104)

Key Words: Hypertension; Home blood pressure; Guidelines

Introduction

Proper management of hypertension can reduce the risk of cardiovascular disease and extend life.¹⁾ Unfortunately, management of hypertension remains suboptimal leading to higher morbidity and mortality.²⁾ The situation is similar in Korea. The Korea National Health and Nutrition Examination Survey showed that only 42.4% of patients with hypertension archived target blood pressure (BP) in

Received: 2012,9,12, Revised: 2012,9,26, Accepted: 2012,9,26

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2008. Recently, studies on barrier against optimal BP control showed that barrier is oriented from not only patient but also physicians. Suggested physician related barriers include non-adherence to published guidelines and failure to emphasized life style modification.²⁻⁴⁾ Therefore, it is important to understand physician's attitude and knowledge on the contents from hypertension guideline, which already has been reported insufficient in the previous studies.^{5,6)} Recently, current hypertension guidelines recognized clinical importance of home BP measurement based on the studies indicate prognostic significant of home BP is better than causal office BP measurement.⁷⁾ In 2007, the Society of Korean Hypertension published BP monitoring guideline regarding home BP measurement. The aim of this study is to investigate the level of awareness and knowledge of Korean physicians on home BP monitoring recommended in current guideline.

Subjects and methods

We designed a survey to determine primary physician's knowledge and acceptance of the guidelines. This survey asked about the awareness and the recommendation in real practice on home BP measurement based on the current hypertension guideline. The questionnaires also asked the issues about pre-hypertension and life style modification (Appendix 1).

1. Study population

We conducted a questionnaire survey among 36 primary physicians who attended an internal medicine seminar held in tertiary medical center. The same survey was carried out among 25 residents under training of internal medicine of a tertiary hospital.

2. Survey questionnaire

The study instrument was a self-administrable ques-

tionnaire consisting of multiple choice questions. The questions of this survey assessed the physicians' practice and knowledge on home BP measurement, prehypertension, and life style modification. Questions focused on home BP measurement procedure were made on the basis of home BP measurement guideline⁸⁾ recommended procedure of home BP monitoring is as follows: measure 2 times a day (in the morning and evening); in the sitting position; measurement 2 to 5 minutes after taking rest; in the morning within 1 hour after waking up, after micturition; in the evening, just before going to bed; and don't take caffeine or smoke within 30 minutes sitting.

3. Statistics

All analyses and calculation was performed using SPSS ver. 12.0 (SPSS Inc., Chicago, IL, USA). For categorical variables, counts and percentages are presented. Chi-square test or Fisher's exact test were used to compare categorical variables. To compare tendency of recommendation between questions about non-pharmacologic treatment, Fisher's exact test was used and a p-value < 0.05 was considered to be statically significant.

Results

Total of 61 doctors were enrolled in this survey (Table 1). Among them, 36 doctors (59%) were primary physicians who have treated hypertensive patients more than five years. Fifty-five percent of the primary physicians (n = 20) practiced in the local clinic and 16 physicians practiced in community hospital. Twenty five (40.9%) doctors worked as residents in a tertiary medical center.

1. Recommendations of life style modifications

Most of primary physicians answer they advised to their patients lifestyle modifications recommended by published guidelines, such as salt restriction, aerobic ex-

Table 1. Baseline characteristics of participants

	Primary physicians (n = 36)	Residents (n = 25)
Years in practice (yr)		
<5	0	25
5-9	16	0
10-19	9	0
≥20	11	0
Working place		
Clinic	18	0
Community hospital	16	0
Tertiary hospital	0	25

Values are presented as number.

ercise, stop smoking, weight reduction, and limitation of alcohol intake. But compared to salt restriction, aerobic exercise, and stop smoking, physicians are less likely to recommend the limitation of alcohol intake (80.3%) to their patients (limitation of alcohol vs. stop smoking, $p = 0.001$; limitation of alcohol vs. exercise, $p = 0.005$; limitation of alcohol vs. restriction of salt, $p = 0.001$). But there was no difference between primary physicians in

local clinic and in community hospital, also between primary physicians and residents (Table 2).

2. Recommendation of home blood pressure measurement and knowledge on home blood pressure measurement

More than half (65.5%) of the participants recommended home BP to their patients with hypertension (Table 3). More primary physicians were likely to recommend home BP measurement compared to resident group (48% vs. 77.7%, $p = 0.027$). More primary physicians encouraged their patient to record home BP measurements (12% vs. 69.4%, $p < 0.001$). More primary physicians practicing in clinics recommended home BP measurement and encourage recording the home BP reading to their patients compared to primary physicians in community hospital. But the tendency was not statically significant.

Table 2. Life style modifications advised for patients with hypertension

	Primary physicians (n = 36)		Residents (n = 25)	Total (n = 61)
	Local clinic (n = 20)	Community hospital (n = 16)		
Weight loss	90	100	84	90.1
Regular aerobic exercise	95	100	96	96.7
Salt restriction	100	100	100	100
Limitation of excessive alcohol consumption	75	87.5	80	80.3
Stop smoking	95	100	100	98.3

Values are presented as percentage. p-values vs. limitation of excessive alcohol intake were obtained by Fisher's exact test.

* $p < 0.05$

Table 3. Recommendation of home blood pressure (BP) measurement and documentation home BP measurement to the patients with hypertension

	Primary physicians (n = 36)			Residents (n = 25)	Total (n = 61)
	Local clinic (n = 20)	Community hospital (n = 16)	Total (n = 36)		
Recommendation on home BP measurement	85	68.7	77.7*	48*	65.5
Recommendation on recording home BP measurement	80	56.2	69.4†	12†	45.9

Values are presented as percentage. p-values between primary physicians and residents were obtained by Fisher's exact test.

* $p = 0.027$.

† $p < 0.001$.

Table 4. Awareness of procedure for home blood pressure (BP) measurement

	Primary physicians (n = 36)		Residents (n = 25)	Total (n = 61)
	Local clinic (n = 20)	Community hospital (n = 16)		
Procedures for home BP measurement				
Measure twice a day	40	31.2	40	37.7
In the sitting position	95	93.7	92	93.4
Measurement 2 to 5 minutes after taking rest	90	93.7	88	90.1
Measurement in the morning before meal and after micturia and within 1 hour after wake up	75	81.2	76	78.6
Measure just before going to bed	30	27.7	20	24.5
Don't take caffeine or smoke within 30 minutes	75	68.7	88	78.6
Following all items above	25	12.5	12	16.3

Values are presented as percentage.

In response to the question about the frequency of home BP measure in a day, 58.3% of primary physicians answer 'once a day' and only 36.1% 'twice a day.'

Only 16.4% of the physicians answered correctly to all the items asking the procedure of home BP measurement (Table 4). But there was no difference between primary physicians in local clinic and in community hospital (27% vs. 12.5%, $p = 0.412$), also between physicians and residents (12% vs. 19.4%, $p > 0.05$). No significant difference was shown between groups according to the period of practice years (5–9 years vs. 10–19 years vs. ≥ 20 years; 12.5% vs. 11.1% vs. 36%; $p = 0.234$).

3. Attitude and awareness on prehypertension

Majority of physicians answered correctly to the questions about adverse outcome of prehypertension (88.5%) and the need of treatment of prehypertension (96.7%). There were no significant differences between primary physicians in local clinic and in community hospital, also between primary physicians and residents.

Discussion

Our survey showed that physicians have acceptable knowledge and attitude on the contents of published

guidelines on prehypertension, life style modification, and recommendation of home BP measurement, but low consistency with the details of BP measuring.

Most of the physicians advised to their patient the principles of life modification such as sodium restriction, weight loss, regular aerobic exercise, and stop smoking with acceptable level. But physicians recommended significantly less the limitation of alcohol consumption compared to the other contents (sodium restriction, regular aerobic exercise, and stop smoking). This relative reluctance is thought to be originated from the generous Korean culture to alcohol intake. Actually, excessive alcohol intake is becoming a major health problem in Korea. According to the World Health Organization report, Korea ranks 2nd in alcohol consumption per capita and the prevalence of at risk alcohol intake has increased from 14.9% in 2005 to 19.7% in 2008.⁹⁻¹¹⁾ Unlike moderate alcohol intake lowering the risk of cardiovascular events among healthy adults, excessive or binge drinking is associated with higher cardiovascular disease risk.¹²⁾ Fortunately, the movement to change this generous Korean culture is rising in recent. According, physicians have to take more effort to be sensitive to the risk of alcohol and to teach the correct habit of alcohol intake in hypertensive patients.

Another reason of reluctance may be physician's doubt about the efficacy of brief alcohol counseling in clinics on patient's behavior. But there are two randomized controlled trials, which showed that regular 10 to 15 minutes brief physician advice decreased alcohol use in the problem alcohol drinkers.^{13,14)} Thus screening alcohol use disorder and brief counseling by physicians as a part of hypertension management should be encouraged.

Recent several hypertension guidelines recognized clinical implication of home BP measurements as a optional tool for diagnosis hypertension and long term managements of hypertension.⁷⁾ As BP is continuously changing and influenced by many factors, a single reading of office BP doesn't represent patient's BP exactly.¹⁵⁾ Home BP measurement provides multiple measurements under relatively controlled condition over long term period. Therefore, multiple home BP measurements represent true BP statue with high reproducibility and predict clinical outcome of hypertension better than office BP measurement and comparable to 24-hour ambulatory BP.^{7,16)} In this survey majority (77.7%) of primary physicians recognized the role of home BP measurement and recommend it in practice. But significantly residents were less likely to recommend, which is thought to originate from their lack of practice.

Several recent studies suggests that high reproducibility of home BP is originated from not only the greater number of measurements but also fixed conditions for home BP measurements such as time of day, resting condition, and constant position. Therefore, encouraging measurement under the fixed condition would improve the reproducibility of home BP.¹⁷⁾ However, in our study, only 16.5% of physicians followed home BP measure condition which was recommended by Korean and National Institute of Clinical Excellence guideline of home BP monitoring. Participants agreed with the recommended procedure fairly well except items about how many times

should be measured and home BP should be measured just before going to bed. More than half (58.3%) of primary physicians preferred measurements only once a day and less than 20% recommended home BP measurement just before going to bed.

It's necessary to share a standardized home BP procedure among physicians to increase clinical significance and comparability of home BP monitoring.¹⁸⁾ But this result indicates discrepancies between guideline and practice in home BP monitoring despite majority primary physicians recommend home BP measurement. Therefore, the promotion of physicians to equip the detail knowledge on the standard procedure is warranted.

There are several limitations in our study including selection bias, relative small number, and the verification of questionnaires. But considering that the subjects of our study were physicians attending educational program with eager interest on hypertension, it is thought to be meaningful that awareness of home BP guideline is poor in this group.

In conclusion, the practice pattern of physicians is consistent with current hypertension guideline except encouraging the limitation of alcohol intake and home BP measurement, although majority of primary physicians recommend home BP measurement. This suggests that the screening on alcohol use and brief counseling by physicians should be encouraged and promoting physicians to know home BP measurement in detail as guideline recommend is needed.

Summary

배경: 고혈압치료에서 자가혈압측정의 중요성이 대두되고 있다. 이에 발맞추어 고혈압학회에서는 2007년 자가혈압측정가이드라인을 발간하였으나 현재까지 일차진료에서 자가혈압측정의 실태 및 자가혈압 가이드라인에 대한 순응도에 관한 연구결과가 없는 실정이다. 본 연구는

실제 임상에서 한국의 일차진료의의 자가혈압측정 가이드라인에 대한 순응도 및 임상 실태를 확인하는 것이 목표이다.

방법: 일차진료의 36명과 서울지역의 한 3차 의료기관 전공의 25명을 대상으로 자기기입식 설문지조사를 진행하였다. 설문지 내용은 자가혈압측정의 방법 및 전 단계 고혈압과 고혈압의 비약물치료로 구성되었다. 자가혈압측정의 방법은 2007년 고혈압학회의 혈압모니터링 가이드라인을 기반으로 하였고 기타 다른 내용은 최근에 발간된 고혈압 가이드라인을 중심으로 하였다.

결과: 대부분의 참가자들은 전 단계 고혈압은 정상 혈압군에 비해 심혈관계질환의 위험도가 증가하며(88.5%), 비약물적 치료가 필요함(96.7%)을 알고 있었다. 고혈압의 비약물적 치료에 대한 항목에서, 금주를 제외하고(80.3%) 염분섭취 제한, 금연, 체중조절, 지속적 유산소 운동을 권유하는 비율이 90% 이상이었다. 금주를 권유하는 비율은 다른 고혈압의 비약물치료 항목에 비해 유의하게 낮았다. 자가혈압측정에 대한 항목에서 대다수(77.7%)의 일차진료의는 자가혈압측정을 환자에게 권유하였으며 이에 비해 전공의가 권유하는 비율은 유의하게 낮았다(48% Vs. 77.7%, $p = 0.027$). 하지만 양 군 모두 자가혈압측정 가이드라인에서 제시한 측정 조건에 대해서 낮은 순응도를 보였다(12% Vs. 19.4%, $p > 0.05$).

결론: 자가혈압측정 가이드라인과 실제 일차진료의 자가혈압측정 실태가 차이가 있으며 다른 항목에 비해 금주에 대한 권유와 자가혈압측정에 대한 지식수준이 유의하게 낮은 것을 보여주고 있었다. 따라서 외래에서 고위험 음주군에 대한 선별 및 금주 권유가 고혈압치료의 한 방편으로 권장되어야 할 것이며 적절한 자가혈압측정을 위해 자가혈압측정 가이드라인의 방침을 더욱 알리는 노력이 필요하겠다.

Conflict of interest: none declared.

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Appendix 1. Key questions of questionnaire

1. Do you recommend home blood pressure (BP) measure to patients in practice?
1) Yes 2) No
2. Do you recommend recording home BP measurement to patients?
1) Yes 2) No
3. Please choose your recommendation of how many times home BP should be measured in a day?
1) Once 2) Twice 3) Three times or more 4) No recommendation

Please select your recommendation of home BP measurement condition.

1. In the morning
 - 1) Home BP measurement timing in the morning
 - (1) Within 1 hour after waking up ()
 - (2) At least 1 hour after waking up ()
 - (3) Any time in the morning ()
 - 2) Home BP measurement after micturia or before micturia in the morning
 - (1) After micturia ()
 - (2) Before micturia ()
 - 3) Home BP measurement after breakfast or before breakfast
 - (1) Before breakfast ()
 - (2) After breakfast ()
2. In the evening (timing)
 - 1) Before dinner ()
 - 2) Just before going to bed ()
 - 3) At least 1 hour before going to bed ()

Following question is regarding prehypertension. Please choose yes or no for each of the followings.

1. Prehypertension is associated with higher risk of cardiovascular disease compared to normotensive subjects (yes/no).
2. Subjects with prehypertension should be treated by life style modification (yes/no).