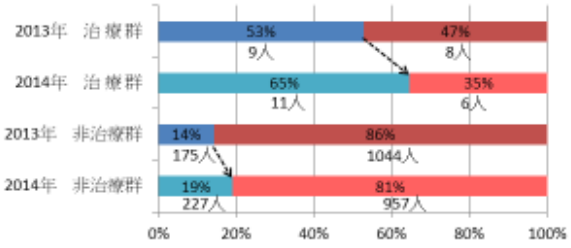
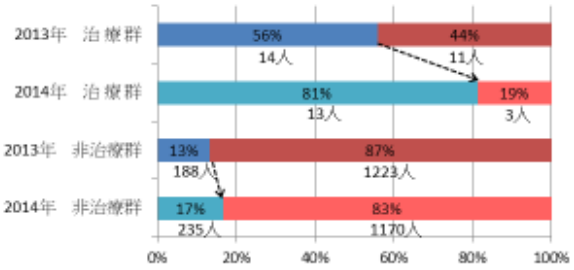
認知率

慢性腎臓病（CKD）について聞いたことがありますか？

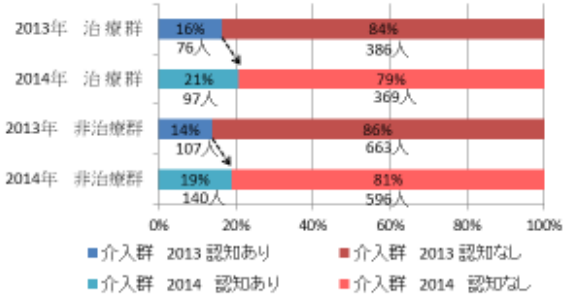
（医療関係者を除く）

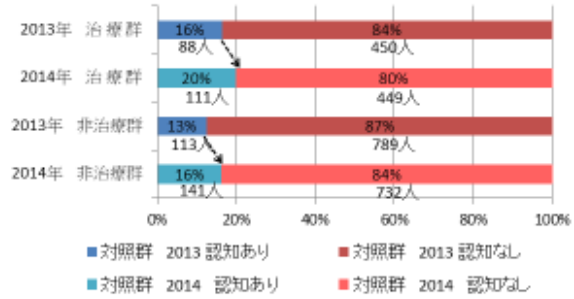
腎臓病治療群別





生活習慣病治療群別

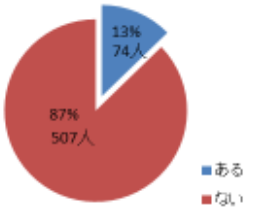




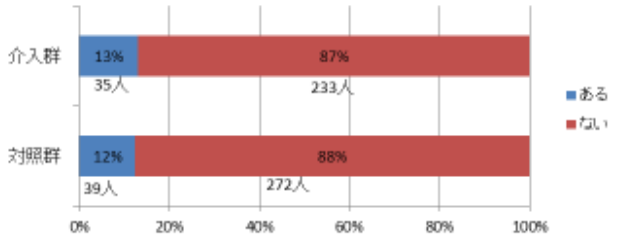
自覚率

過去に医師や医療関係者から、腎臓病であるとか、腎機能が低下しているといわれたことがありますか？

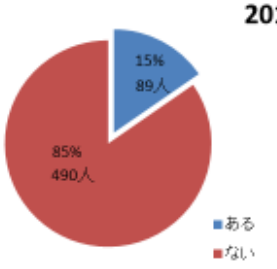
2013年

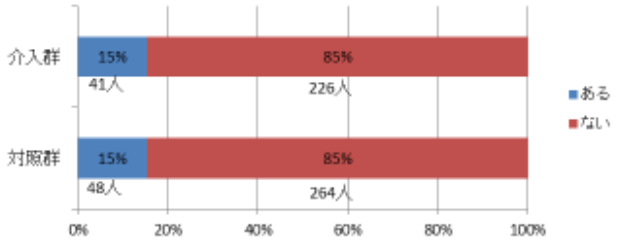


（医療関係者を除くCKD患者対象）



2014年





結果のまとめ

- 2013、2014年のCKD認知率は年齢、GFR区分、生活習慣病治療有無別でも介入群、対照群間で有意差は無かった。

- 新たな認知は介入群で13.1%、対照群で11.2%、認知の維持は介入群で53.8%、対照群で55.0%であった。CKD認知があっても翌年には45%以上がCKD認知が無くなっていた。

- CKD自覚率は12～15%と低かった。

結語

リーフレットによるCKD啓発効果は認められず、CKD認知は定着が難しいことが明らかとなった。新たなCKD啓発手法の開発が喫緊の課題である。

Low awareness and comprehension of chronic kidney disease among Japanese health-check subjects

Yoshinari Yasuda[1]*, Mayumi Kamiya[1], Yohei Maeshima[2], Tadao Akizawa[3], Seiichi Matsuo[1] and Shoichi Maruyama[1].
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[1]Department of CKD and PD, Okayama University, Okayama, Japan and
[1]Department of Nephrology, Showa University, Tokyo, Japan.

Background

- CKD has been highlighted as one of serious risk factors for ESKD and CVD.
- CKD prevalence is high in Japan and estimated CKD patient number is 13.3 million, thus one-eighth of Japanese adults were affected with CKD.

  Imai E et al. *CEN* 2009
- However it is worried that the vast majority of CKD patients do not recognize their CKD, because CKD was the recently defined disease which usually lacks a subjective symptom.

Background

- To improve CKD cognition among health professionals and general population, Japan CKD Initiatives (J-CKDI) was founded in 2006 by collaboration with JSN, JSDT, JSPN and JMA.

- In 2014, 85 World Kidney Day symposium/events sponsored by MHWL or J-CKDI were held all over Japan.

Objective

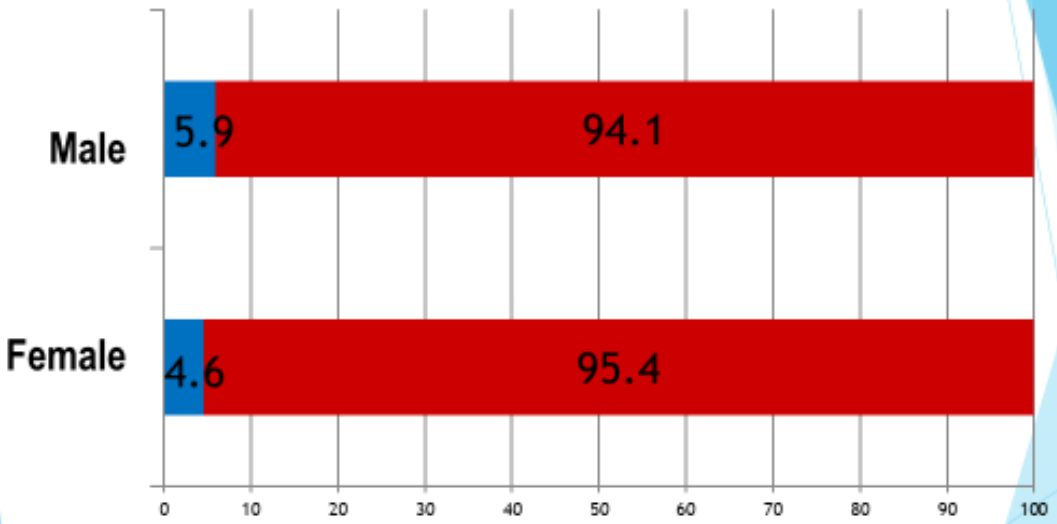
- CKD awareness and comprehension degree was surveyed among Japanese health-check subjects in this study.

Methods

- Study subjects were 7,513 health-check subjects (3,551 females) in Kasugai City Medical Care Center, Aichi prefecture, Japan.

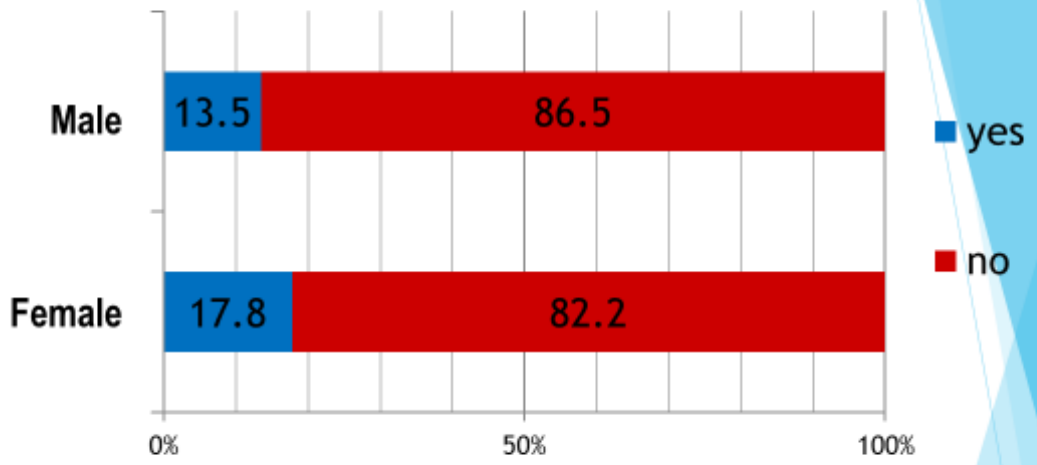
- Questionnaire survey including CKD awareness, self-reported renal function, knowledge questions on diagnosis, risk factors and clinical symptoms of CKD was conducted in 2013 and CKD awareness and comprehension degree was analyzed.

Q. "Have you ever been told by a doctor or other health professional that you had weak or failing kidneys (excluding kidney stones, bladder infections, or incontinence)?"



- CKD prevalence was approx. 13.3% among Japanese adults.
  Imai E *et al. CEN* 2009
- 2.0% of American adults answered "yes" in NHANES 1999 to 2000.
  Coresh J *et al. JASN* 2005

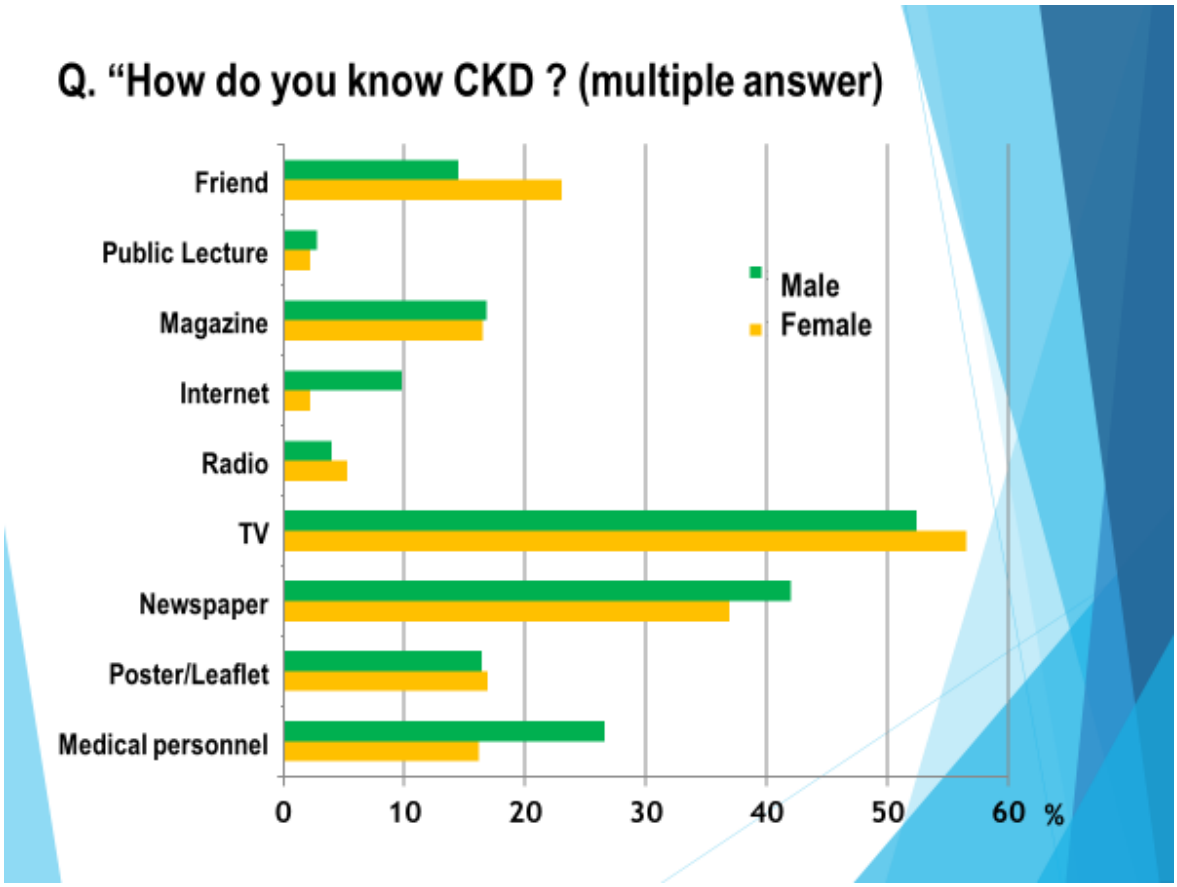
Q. “Have you ever heard about CKD ?



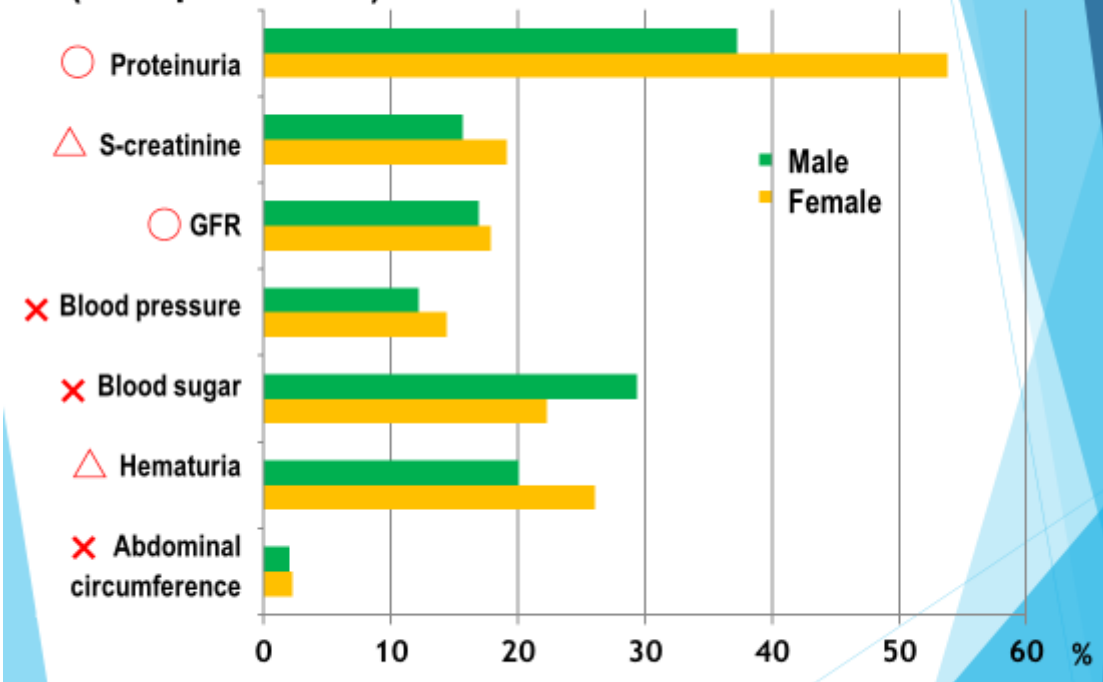
- Among subjects under treatment for HTN, DM or DL, cognitive rate was slightly but significantly high at 18.2% ($p<0.001$), but only 20.6% of those knew their renal function.
- Cognitive rate for metabolic syndrome was 89.3%.

  Food and education white paper 2012
- Cognitive rate for locomotive syndrome was 36.1%.

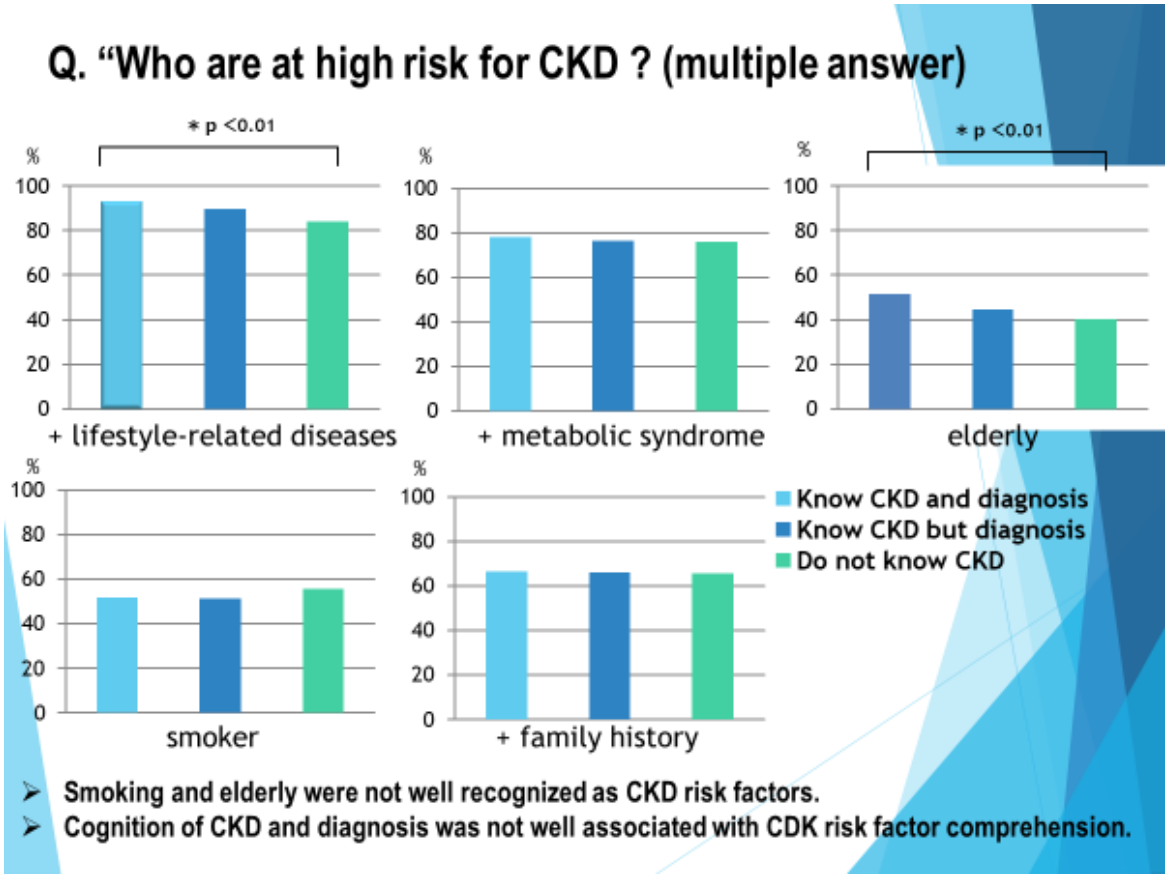
  Attitude survey for locomotive syndrome 2014


Q. “How do you know CKD ? (multiple answer)
Friend
Public Lecture
Magazine
Internet
Radio
TV
Newspaper
Poster/Leaflet
Medical personnel
Male
Female
0
10
20
30
40
50
60
%

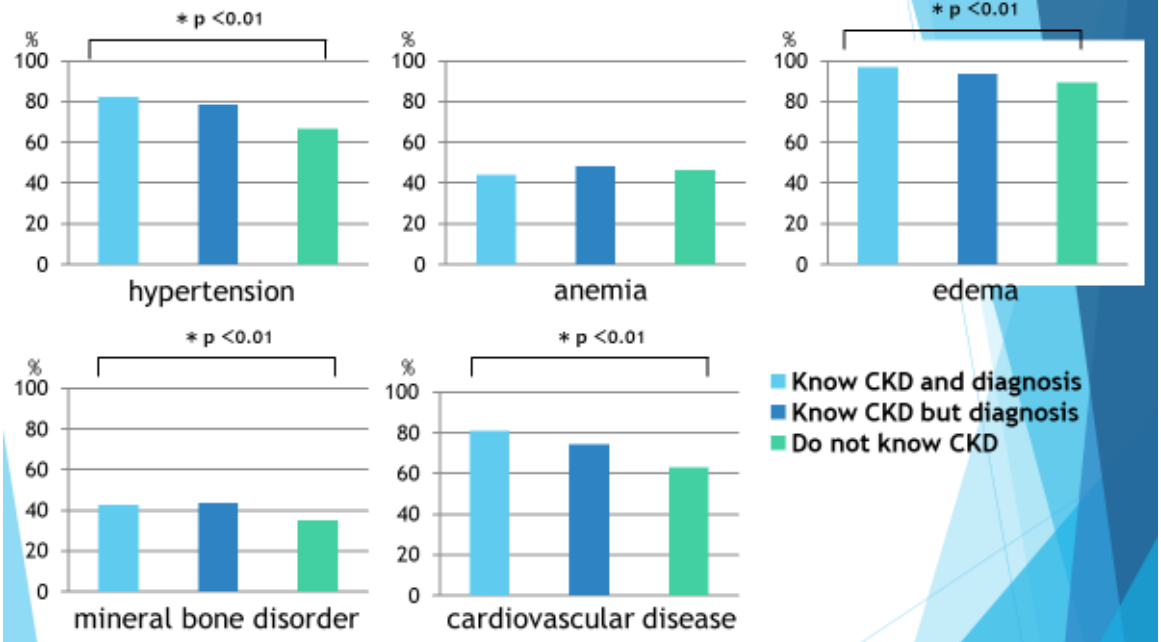
Q. "What are essential items for CKD diagnosis ? (multiple answer)



- Proteinuria was recognized at 58.9%, but GFR was poorly recognized at 31.5%.
- Proper understanding for CKD diagnosis was only at 4.6%.


Q. “Who are at high risk for CKD ? (multiple answer)
＊p <0.01
%
100
80
60
40
20
0
+ lifestyle-related diseases
+ metabolic syndrome
＊p <0.01
elderly
smoker
+ family history
Know CKD and diagnosis
Know CKD but diagnosis
Do not know CKD
Smoking and elderly were not well recognized as CKD risk factors.
Cognition of CKD and diagnosis was not well associated with CDK risk factor comprehension.

Q. “What are clinical symptoms of CKD ? (multiple answer)



- Regarding clinical symptoms of CKD, edema and hypertension were recognized sufficiently followed by CVD, but renal anemia and mineral bone disorder were poorly recognized.
- Cognition of CKD and diagnosis was associated with CDK symptom comprehension.

Randomized Control Trial on CKD awareness

- Health-check subjects in Kasugai City Medical Care Center
- Questionnaire survey was conducted in 2013.
- Among Intervention group, a leaflet on CKD was handed.
- The same questionnaire survey is conducted in 2014 and CKD awareness and comprehension degree will be analyzed.

Do you think that a leaflet can change the world?

This study was supported by research grant from MHWL and was approved by the ethical committee of JSN.

Conclusion

- The mid-term result of our RCT revealed that CKD awareness and comprehension degree remained low in Japan even among health-check subjects.
- CKD enlightenment campaigns in collaboration with government, the mass media, health professionals and academic societies are essential to improve CKD awareness, and their effect should be adequately monitored at regular intervals.

主な研究成果物

Clinical Correlates of Ambulatory BP Monitoring among Patients with CKD

Satoshi Iimuro, Enyu Imai,† Tsuyoshi Watanabe,‡ Kosaku Nitta,§ Tadao Akizawa,‖ Seiichi Matsuo,† Hirofumi Makino,¶ Yasuo Ohashi,** and Akira Hishida,†† for the Chronic Kidney Disease Japan Cohort Study Group*

Summary

Background and objectives Ambulatory BP monitoring (ABPM) allows a better risk stratification than office BP in hypertensive patients. However, the clinical relevance of ABPM has not been extensively investigated in the CKD population.

Design, setting, participants, & measurements Within the Chronic Kidney Disease Japan Cohort study, 2977 patients enrolled (62% men, aged 60.8±11.6 years) and ABPM was conducted in a subgroup of patients from September 2007 to April 2010. Data from 1075 patients (682 men) were analyzed to determine BP control and factors associated with the ABPM parameters.

Results The prevalence of masked hypertension was 30.9%, whereas that of white-coat hypertension was 5.6%. With advancing CKD stage, the percentage of persistent hypertension increased from 21.7% to 36.1%. Diabetes, antihypertensive medicine use, and low estimated GFR (eGFR) were significantly associated with the difference between office BP and ambulatory BP (1.7 mmHg, 2.6 mmHg, and 0.6 mmHg per 10 ml/min per 1.73 m^2, respectively). There tended to be fewer nondippers and risers in stage 3 than in stages 4 and 5. In the nocturia-negative group, low eGFR, diabetes, and summer season were identified as factors associated with lower nocturnal BP change (−0.5 mmHg, −2.0 mmHg, and −2.8 mmHg, respectively). Morning BP change was greater with older age (0.2 mmHg per 10 years) and higher body mass index (0.6 mmHg per 1 kg/m^2), and in winter (4.5 mmHg) versus summer.

Conclusions Various factors including eGFR, diabetes, antihypertensive medication use, and season are associated with higher BP and abnormal BP patterns in CKD patients.

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Introduction

BP fluctuates diurnally and seasonally. In epidemiologic studies, office BP has been used as representative BP. Despite its fluctuating nature, the office BP was identified as the most important risk factor for cardiovascular diseases. It dates back to the Framingham Heart Study (1–3) for the BP to be named as the risk factor, and as the study continues to the third generations of the participants, BP was controlled at ever lower levels (4). In the past decade, BP has frequently been discussed in association with CKD (5–7).

Because the concepts of masked hypertension (MHT) and white-coat hypertension (WCHT) are well recognized (8–10), studies measured only by the office BP are thought to be insufficient. At the same time, parameters derived from ambulatory BP monitoring (ABPM) have been reported to serve as predicting factors for various organ failures (11–15). In particular, the association between circadian variations in BP and cardiovascular events has been studied from various approaches (12,16–20).

The Chronic Kidney Disease Japan Cohort (CKD-JAC) observational study was started in 2007 to investigate CKD among Japanese adults and 2977 participants were enrolled (21,22). For each patient, ABPM was performed once at the start of the study. The purpose of this study is to describe the characteristics of BP in CKD patients using registration data and to evaluate the background factors that influence ABPM data.

Materials and Methods

CKD-JAC

A detailed description of this study was previously published (22). In brief, CKD-JAC participants were Japanese or Asian living in Japan, aged 20–75 years, and had stage 3–5 CKD. The major exclusion criteria were patients with polycystic kidney disease, HIV infection, liver cirrhosis, or cancer, and transplant recipients and patients who previously received dialysis.

ABPM and Patient Questionnaire

ABPM was conducted within a half year after the patient's investigation start. BP was measured every

30 minutes for a 24-hour period with the TM-2421 device (A&D Company Limited, Tokyo, Japan). Each patient took the device home and began measurements at their convenience. ABPM data were collected on 1117 patients. Every patient's ABPM data was visually checked to detect inadequate data, including outliers, and 34 patients were determined to be invalid participants. Duplication was seen in two patients, and six patients withdrew consent. Therefore, 1075 patients were available for analysis (Supplemental Figure 1).

A simple questionnaire was completed by each patient at the time of the ABPM, and the questionnaire collected information such as the time the patient went to bed, the time the patient got up, the frequency of waking up to use the lavatory, and information about how the monitoring affected sleep. *Night-time* was defined as actual sleep time using the patient's diary. The International Continence Society defined *nocturia* as a complaint that an individual has to wake ≥1 times at night to void (23). However, there are relatively large individual differences between the frequency of night-time urination and the level of complaints. For this study, nocturia was defined as when the patient awakens for urination ≥3 times during a night (20th higher percentile). Quality of sleep was rated on a four-category scale from "as usual" to "much difficulty sleeping."

Nocturnal BP Change and Its Patterns

The degree of nocturnal BP change (NBPC) was calculated by the following equation:

$$\text{degree of NBPC} = 100 \times ([\text{mean daytime systolic pressure}] - [\text{mean nocturnal systolic pressure}])/[\text{mean daytime systolic pressure}]$$

Patients with NBPC >10% and <20% were classified as "dippers," >20% as "extreme dippers," 0% to <10% as "nondippers," and <0% as "risers." These cutoff points are based on the guidelines for ABPM by the Japanese Circulation Society (24) as well as a previous study (12).

Morning BP Change

Morning systolic BP (SBP) was the average of SBP during the first 2 hours after awakening time (four SBP readings). The lowest SBP was the average SBP of three readings centered on the lowest night-time reading. Morning BP change (MBPC) was defined as the morning SBP minus the lowest SBP.

Specification of the Season for ABPM

The season for ABPM was divided into summer and winter according to the data from the Chronological Scientific Tables by the National Astronomical Observatory of Japan. The season was determined as summer if the mean monthly temperature in the region of the participating facility was >20°C, and as winter when the temperature was <20°C.

Office BP Measurement

All of the BP measurements were performed by an automated sphygmomanometer after 5 minutes of rest. Three consecutive seated readings were recorded. In our analysis, office BP was the mean of these three readings.

Table 1. Characteristics of study participants

	Women	Men
Number of participants	393 (36.6)	682 (63.4)
Age (yr)	58.5±12.3	62.0±10.6
CKD stage		
3	169 (43.0)	302 (44.3)
4	165 (42.0)	284 (41.6)
5	59 (15.0)	96 (14.1)
eGFR (ml/min per 1.73 m^2)	28.7±12.6	28.8±11.9
BMI (kg/m^2)	22.6±4.3	23.6±3.3
Overweight (BMI ≥25)	78 (19.9)	182 (26.7)
Obesity (BMI ≥30)	23 (5.9)	29 (4.3)
Antihypertensive medicine use	343 (87.3)	632 (92.7)
Diuretic use	109 (27.7)	181 (26.5)
Office SBP, by CKD stage (mmHg)	129.8±18.6	132.1±17.8
3	127.3±17.8	129.7±17.2
4	130.7±18.8	132.7±17.8
5	134.5±19.4	137.8±18.8
Office DBP, by CKD stage (mmHg)	76.3±11.2	77.6±11.5
3	75.2±10.8	77.9±11.3
4	76.9±11.5	77.3±11.5
5	77.5±11.2	77.5±12.1
Morning BP change, by CKD stage (mmHg)	21.6±16.6	23.5±16.5
3	22.0±16.6	23.4±16.3
4	21.5±16.7	23.9±16.8
5	21.2±16.5	22.5±16.6
Diabetes mellitus[a]	128 (32.6)	253 (37.1)
Proteinuria[b]	345 (89.6)	581 (88.0)
Nocturia	50 (12.8)	154 (22.8)
Much difficulty in sleep	75 (19.1)	143 (21.2)
Examination period		
Summer	102 (26.0)	188 (27.6)
Winter	291 (74.1)	494 (72.4)

Data are *n* (%) or mean ± SD, unless otherwise indicated. The data of 1075 participants who underwent ambulatory BP monitoring were summarized. eGFR, estimated GFR; BMI, body mass index; SBP, systolic BP; DBP, diastolic BP.
[a]Diabetes mellitus was diagnosed when at least one of the following criteria was met: diabetes mellitus described as an underlying disease or complication of CKD as reported by a physician, hemoglobin A1c (National Glycohemoglobin Standardization Program) of >6.5%, or concomitant use of antihyperglycemic medications including insulin.
[b]Proteinuria was identified when the urinary albumin/creatinine ratio from spot urine was ≥30 (mg/g creatinine).

Diagnostic Criteria for Hypertension

A diagnosis of hypertension was made if the office BP was >140/90 mmHg or 24-hour average BP from ABPM was >130/80 mmHg, based on the Japanese Society of Hypertension guidelines (25).

Definitions of WCHT, MHT, and Persistent Hypertension

We classified hypertension using thresholds of office BP of 140/90 mmHg and 24-hour average BP of 130/80 mmHg. WCHT is the office BP ≥140/90 mmHg and

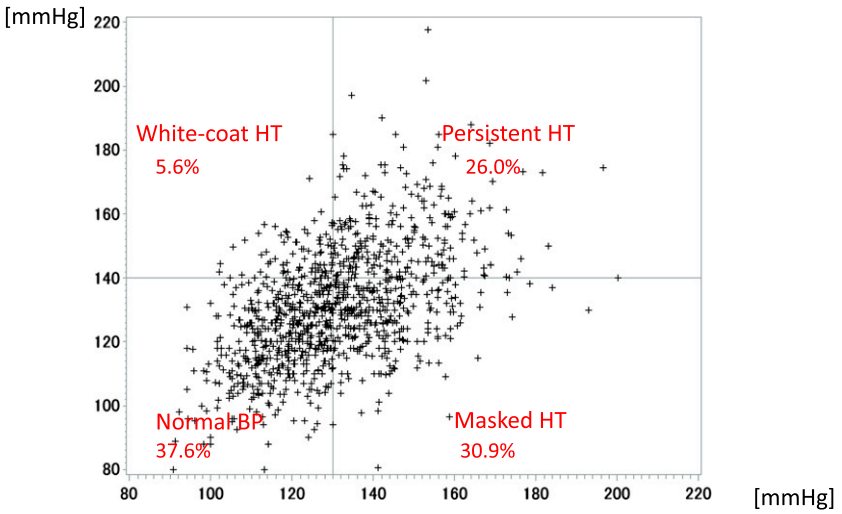

Figure 1. | **Two-dimensional scattered plot of office systolic BP and 24-hour average systolic BP**. The vertical axis shows office systolic BP, whereas the horizontal axis shows 24-hour average systolic BP. When determining the four patterns of BP shown, both systolic and diastolic pressures were taken into account. The cutoff levels for the diagnosis of hypertension (HT) were 140/90 mmHg for office BP and 130/80 mmHg for 24-hour average BP. White-coat HT, hypertensive office BP and normal 24-hour average BP; persistent hypertension, hypertensive office BP and hypertensive 24-hour average BP; normal BP, normal office BP and normal 24-hour average BP; masked HT, normal office BP and hypertensive 24-hour average BP.

Table 2. Factors associated with hypertension patterns

	BP Pattern				Total	*P* Value
	Normal BP	White-Coat Hypertension	Masked Hypertension	Persistent Hypertension		
Total participants	404 (37.6)	60 (5.6)	332 (30.9)	279 (26.0)	1075 (100.0)	
CKD stage						
3	199 (42.3)	27 (5.7)	143 (30.4)	102 (21.7)	471	0.01
4	160 (35.6)	25 (5.6)	143 (31.9)	121 (27.0)	449	
5	45 (29.0)	8 (5.2)	46 (29.7)	56 (36.1)	155	
Sex						
Women	176 (44.8)	23 (5.9)	106 (27.0)	88 (22.4)	393	0.002
Men	228 (33.4)	37 (5.4)	226 (33.1)	191 (28.0)	682	
Antihypertensive medicine use						
No	52 (52.0)	3 (3.0)	28 (28.0)	17 (17.0)	100	0.01
Yes	352 (36.1)	57 (5.9)	304 (31.2)	262 (26.9)	975	
Diuretic use						
No	305 (38.9)	41 (5.2)	234 (29.8)	205 (26.1)	785	0.39
Yes	99 (34.1)	19 (6.6)	98 (33.8)	74 (25.5)	290	
Overweight						
No	332 (40.7)	46 (5.6)	245 (30.1)	192 (23.6)	815	0.001
Yes	72 (27.7)	14 (5.4)	87 (33.5)	87 (33.5)	260	
Diabetes						
No	300 (43.2)	36 (5.2)	209 (30.1)	149 (21.5)	694	<0.001
Yes	104 (27.3)	24 (6.3)	123 (32.3)	130 (34.1)	381	
Proteinuria						
No	76 (63.9)	7 (5.9)	23 (19.3)	13 (10.9)	119	<0.001
Yes	316 (34.1)	51 (5.5)	300 (32.4)	259 (28.0)	926	
Season						
Summer	129 (44.5)	24 (8.3)	79 (27.2)	58 (20.0)	290	0.001
Winter	275 (35.0)	36 (4.6)	253 (32.2)	221 (28.2)	785	

Data are presented as *n* (%) unless otherwise indicated. Hypertension is classified into the above-listed four patterns, using thresholds of office BP of 140/90 mmHg and 24-hour average BP of 130/80 mmHg. The *P* value for general association is the general correlation between row and column, and it means a rough indication of correlation between background factors and these BP patterns. The ratio of BP patterns and background factors such as CKD stage, sex, antihypertensive medication use, diuretic use, obesity, proteinuria, diabetes, and season were analyzed.