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高血圧の予防診療法の技術評価に関する研究

報　告　書

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目　次

はじめに

　高血圧は、患者数、合併症、そして医療費の観点から見て、日本人の健康上、最も重大な疾患の一つである。したがって、高血圧の対策は、日本の医療界をあげて最も効果的でかつ効率の良い政策を選択する必要がある。本研究は、平成１０年度から１１年度の２年間に渡る厚生科学研究費補助金（医療技術評価総合研究事業）「高血圧と関連疾患の疾病管理の研究」研究班（主任研究者　鈴木一夫）の研究成果を受けて発足した新研究結果の報告をまとめたものである。

　本年度の研究では、まず高血圧と関連疾患に関する実態の把握に重点を置いた。高血圧疾患は、単独でとめられるものではなく、その他の危険要因、例えば肥満や糖尿病等と合わせて捉える必要がある。また、糖尿病が起こす疾患は、脳卒中や心臓病、腎不全等、様々な重篤な合併症が存在しうる。これらの関係を明らかにし、定量的分析によって高血圧疾患の実態を明らかにすることができた。また、協力研究者等を通して、介入のあるべき姿を、更には高血圧専門医や一般医に対するアンケート調査を通して、高血圧診療の現状の把握を試みた。また、近年、ヨーロッパを中心に新しく発展しているライフコースアプローチ（生涯疫学）について、おそらく日本で最初の取り組みを行ったことを報告している。これらの成果を踏まえて、来年度の研究の更なる展開を試みたい。皆様方の忌憚ないご意見をいただきたい。

　末尾ではあるが、この研究が可能になったのも、分担研究者、並びに多くの研究者の努力によっている。ここに深く謝意を表したい。

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I 疫学的現状評価

Meta-analysis on Therapeutic State of Hypertensive Population in Japan Focusing on the Impact of New Diagnostic Criteria of Japanese Guideline for the Management of Hypertension 2000*

Toshihiko Hasegawa, Yoko Hori, Hiroyuki Sakamaki, Kazuo Suzuki

Abstract

A Meta-analysis on the therapeutic state of hypertensive population in Japan is performed by the three nation-wide governmental surveys focusing on the impact of new diagnostic criteria described in the Guidelines for the Management of Hypertension in Japan 2000. These surveys are the National Survey of Circulatory Disorders, National Nutrition Survey and Patient Survey in 1990. The meta-analysis approach is used to evaluate the validity and reliability of these three national data sets, particularly the National Nutrition Survey. The population with history of hypertensive treatment and without previous diagnosis was calculated using the old and new diagnostic criteria. The results of three national surveys are fairly consistent. National Nutrition survey can be used to monitor the overall therapeutic status of Japanese population if the definition is considered judiciously. The impact of new diagnostic criteria is extensive as demonstrated by the results of the analysis on the National Nutrition Survey of 1999. The hypertensive population doubled and one half of the Japanese population over the age of 30 is now defined as hypertensive. A policy to manage this newly diagnosed hypertensive population is urgently needed to lessen the burden on Japanese health care system.

Key words
Hypertension, Meta-analysis, National Nutrition Survey, National Survey of Circulatory Disorders, Guidelines for the Management of Hypertension in Japan (JSH2000)

Introduction

Hypertension is an important disease since it is a major contributing risk factor to other circulatory disease and health care cost[1,2]. In Japan, in particular stroke was the No.1 killer in the past and now has become the largest cause of elderly disability. Health care costs of hypertension treatment can be considered as a good investment if hypertension is controlled well. It is important to evaluate the therapeutic status of the hypertensive population. But the estimation of therapeutics status by different nation-wide government surveys is conflicting [3,4,5]. The objective of this paper is to estimate the therapeutic status of hypertensive population in Japan by Meta-analysis comparing two different kind of survey, a population based survey such as National Nutrition Survey (Note 1), National Survey of Circulatory Disorder (Note 2) and medical facility based surveys, like Patient Survey (Note 3). Application of the results of this study is to authenticate the validity and reliability of National Nutrition Survey

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and Patient Survey, since National Survey of Circulatory Disorders is done only once every ten years. National Nutrition Survey and Patients Survey on the other hand, is available for continuous monitoring because there are done every year and every three years. Then the impact of new diagnostic criteria of Guidelines for the Management of Hypertension in Japan 2000 (Note 4) is evaluated using National Nutrition Survey of 1999 [6,7,8].

Materials and Methods

1. Meta-analysis Between National Survey of Circulatory Disorders and National Nutrition Survey

The therapeutic status measured by National Survey of Circulatory Disorders and National Nutrition Survey is organized around two different principles. The National Survey of Circulatory Disorders is based upon a visit to health care facility, and the National Nutrition Survey is based on drug treatment. The estimation of hypertensives in both surveys is calculated through the prevalence rate in 5 year-age and sex groups and multiplied by each group population.

From the National Survey of Circulatory Disorders, data were divided by the presence of past history of hypertension. For the no past history group, hypertensive population was identified by using the old criteria i.e. the systolic pressure of more than 160 mm Hg or the diastolic pressure more than 95 mm Hg (Note4). For the population with a previous history, three groups, namely, no visit, one visit over more than a one month period, and one visit in less than one month period, and others probably indicating irregular visit were identified.

For National Nutrition Survey, data is classified according to drug treatment status. No drug treatment groups were also classified by blood pressure, systolic pressure of more than one 160 mm Hg, the diastolic pressure more than 95 (old criteria). For the population with history of medication, three groups, namely those that stopped taking medicine, those taking it occasionally, those taking it daily, were identified. Nation-wide estimate is calculated by similar method as the case of National Survey of Circulatory Disorders.

2. Meta-analysis Between National Survey of Circulatory Disorders and Patient Survey

For National Survey of Circulatory Disorders 1990, patient with previous treatment is selected and classified into three groups, namely no current visit to medical facility, visit once more than one month, and visit once less more than one month. The data were classified into five-year age group and sex. The ratio was calculated for each group and multiplied by the general population for each segment to estimate to total number of patients.

For Patient Survey, the 1990 database was used. For each five-year age group and sex group, total patient were calculated using the following formula used by Japanese Government [9].

$$\text{Total patient} = \text{In-patient number} + \text{Out-patient number of one day visit} \times \frac{6}{7} \times$$

$$\text{Visit interval (day)}$$

Main and sub diagnosis of hypertension, visit interval more than one month are included for patients. 95% confidence interval was calculated according to sample size. Estimates of those two databases are compared by five-year age and sex groups.

3. The Estimate of the Impact by New Diagnostic Criteria

By using the National Nutrition Survey 1999 the same calculation was done to estimate the total number of patients by age and sex group. For population without any previous medication, the three categories of population are estimated by age and sex group using new diagnostic criteria. One group composed of those with blood

pressure values of more than systolic 160 or diastolic 95 (Note 4). Next was the group of new hypertensives. Lastly there was a group for the "high normal". Nation wide population was calculated for high normal, new mild hypertensive and traditional undiagnosed hypertensive population. Among treated groups there were those that were taking medication occasionally or daily. Control fraction of treated population were calculated by using 5 year age and sex group fraction multiplied by each segment population.

Results

1) The Estimate of Hypertensive Population by National Survey of Circulatory Disorders 1990 and National Nutrition Survey 1990

According to the 1990National Survey of Circulatory Disorders, population ever treated for hypertension is 18,792,000 including those under admission numbering 16,000 (Chart 1). Outpatient visiting population is 11,151,000. Population with no visit is 6,000,000. Others is 1,627,000. Among the population without previous visit to a medical facility 5,218,000 are hypertensive when using the old diagnostic criteria. Another 11,029,000 are listed as hypertensive when using the new diagnostic criteria. 13,702,000 are normal high when the new diagnostic criteria are applied. Adding these numbers up, there are 22,953,000 hypertensives in the population using the old criteria and 34,982,000 according to the new criteria. According to the National Nutrition Survey 1990, population ever treated by medication is 14,187,000, including those taking daily medication at 9,843,000 and those taking medication occasionally at 932,000 and those that have stopped medication at 3,413,000. Among the population with no previous history of medication 7,149,000 are hypertensive based on old diagnostic criteria, and 12,631,000 are hypertensive according to the new diagnostic criteria with another 14,412,000 for normal high.

2) Comparative Estimate of Hypertensive Population under Medical Care by National Survey of Circulatory Disorders 1990 and the Patients Survey 1990

Estimate using 1990 Patients Survey is 9,422,000 (95%C.I. 9,177,000 – 9,667,000) which is 1,729,000 (15.5%) smaller than the estimate by the 1990 National Survey of Circulatory Disorders. But most of the difference comes from the patients visiting less than once a month, that is, 1,115,000 (95%C.I. 7,853,448 – 13,240,288) by age and sex group (Chart 2). The largest discrepancy is among males aged between 42-60 years visiting medical care facility less than once a month. This discrepancy is generally smaller for females.

3) Estimation of the Impact of New Diagnostic Criteria Used During the National Nutrition Survey of 1999.

Same methods as described above were used to estimate the patients ever treated previously with medication in the hypertensive population without previous drug treatment, using the old and new criteria. Sex and five age groups were used to categorize. Population ever treated was 17,195,000 including those already stopped medication at 2,498,000 (Chart 1). Among the population never treated with drugs, 8,111,000 were hypertensive based on the old diagnostic criteria. Another 21,724,000 were hypertensive based on the new criteria with an additional 14,675,000 as "high normal". When all of these numbers are added together, the hypertensive population totals 25,306,000 applying the old criterion (31.0% of total population age over 30) and 38,918,948 (47.7% of total population age over 30) applying the new criteria. If the "high normal" are also added, this amounts to 53,593,577 (65.7% of total population age over 30). The population fraction of hypertensive population by sex and age group is shown in the Chart 3. The uncontrolled blood pressure fraction among treated hypertensive population is calculated and is shown (Chart 4).

Discussion

1) Meta-analysis for Validity and Reliability of Different Data Sets

Discrepancy of estimated number of patients under current treatment between national cardiovascular diseases survey and National Nutrition Survey is very small 0.38 million in 1990 (3.4% of treated population) (Chart 1). This can be due to a random error or a non-pharmacologically treated population. But discrepancy between population never treated and the population ever treated is 46 million that is significant. It is possible that National Survey of Circulatory Disorders included currently no visiting population. 30% of population with previous diagnostic history of hypertension but currently not visiting a medical facility stopped medication or at least has never taken medication. So about 4 million patients could have been white-coat hypertension or had been controlled by no-pharmacological treatment since about half of this population is normotensive. On the other hand, there is the real hypertensive population because hypertension is a life long disease. Undiagnosed population according to the National Survey of Circulatory Disorders is 5.2 million. This is 7.1 million according to the National Nutrition Survey. The discrepancy is 1.7million but it is probably due to hypertensive fraction of the population who is not visiting to medical care facility. Total was 24.0 million vs. 22.5 million hypertensive population when using the old criteria. This discrepancy is only 1.5 million (6%). However, when the new criteria is used, the differences is small 0.6 million. The undiagnosed fraction of hypertensive population is 21.8% by National Survey of Circulatory Disorders and 31.8% by National Nutrition Survey. This is a 10% difference. Therefore, the total number of the hypertensive population is not different according to the 2 surveys, but the undiagnosed population fraction is different due to the application of different definitions. Caution is therefore required to interpret the undiagnosed fraction when National Nutrition Survey is used. About one third of such a population was once diagnosed as hypertensive but has not been followed up.

For the patients who have been under treatment, the discrepancy between National Survey of Circulatory Disorders and Patient Survey is 1.6million (16.4%). Most of this discrepancy can be explained by the discrepancy in middle age group of the male hypertensive population (Chart 2). The discrepancy could be due to a random error but also the bias due to the sampling methods of survey. Those middle age males are usually the working population. If the clinic at working place is excluded for Patient Survey, the number could be underestimated. But on the other hand, the Patients Survey is supposed to be randomized at clinic level [10]. The other possibility is the recall-reporting bias of National Survey of Circulatory Disorders because it is a self-reported survey done by the medical profession as patients usually responds favorably. Nevertheless, the most likely scenario is the problem of compliance, as this among middle aged workers tend to attend medical care facility very infrequently [5]. The patients treated with medication have an overall uncontrolled rate of 46.5%, but can be as high as 68% in males aged 55 to 49 years old (Chart 4). In the 1999 survey, the controlled rate was brought down in numbers, particularly in the old age group. However when the new diagnostic criteria was applied, the uncontrolled rate became 79.4% although the new guidelines specific to Japan on using this criteria had not been developed until year 2000
.

2) Impact of New Diagnostic Criteria

Hypertensive population using the old criteria in the 1999 survey was estimated at 25.3 million cases. This is an increment of 2.8 million since 1990 (Chart 1). Undiagnosed population increased to 8.1 million with a 1 million increment since the 1990 survey. The fraction of undiagnosed patients is about 30% using the old criteria and this was not changed since the 1990 survey. But caution has to be exercised because this fraction could be smaller depending on the definition. Applying the new criteria, another 21.7 million were included in the hypertensive population. This totals

to 47.0 million, which is 57.7% of population over 30 years of age. The application of the new criteria almost doubles the hypertensive population and now it appears that one out of every two Japanese is considered to be hypertensive. If the "high normal" population is also included, then 75.7% of population is at some risk according to the new diagnostic criteria. The fraction of hypertensive population increases as population ages. The males are always higher than females and at the age over 75, the hypertensive population is 80% when using the new criteria and 60 % when using the old criteria. For estimating the therapeutic status using the old criteria, 6.3 million people are undiagnosed and another 6 million people diagnosed previously as hypertensive are not under control (Chart 3). The therapeutic strategy of expanding diagnostics criteria by JSH 2000 leads to the inclusion of 21 million new patients. This may not be practical because the large hypertensive population by old criteria still has not been controlled well. Lastly, white-coat hypertension i.e. transient hypertension upon meeting the medial profession is well known[11,12,13,14,15]. 10 to 40% of hypertension could be in this category. At least 10% of the 8 million undiagnosed hypertensive population using old criteria and another 21 million using new criteria could be actually an overestimation, because the measurement of blood pressure for National nutrition survey is only at one occasion not particularly time. At least 10% of the 15 million people who are treated with medication by National nutrition survey 1990 population might have been treated unnecessarily. On other hand, false negative blood pressure values have been reported as well [16]. To examine those false (positive and negative) in value requires continuous blood pressure monitoring or home based blood pressure assessments using better measurement methods. It may be difficult to use those methods for nation-wide study but the result of a pilot study in certain areas could be useful to adjust a major survey results [17].

Conclusion

By meta-analysis of three national data set for hypertension, the estimate is consistent provided definition of classification has been taken into account. Discrepancy between National Survey of Circulatory Disorders and National Nutrition Survey seems to be due to the populations who are diagnosed hypertensive but not treated currently. However, the overall hypertensive population is quite similar. National Nutrition Survey can be used for annual follow up and evaluation. Discrepancies between National Survey of Circulatory Disorders and Patients Survey are mainly due to middle-aged male hypertensive population. The reason could be random errors and recall bias. A detailed study is required to reveal the main reason. Nevertheless the overall trend is consistent and the Patient Survey can be very good basis to analyze treatment behavior of hypertensive patients. The impact of the new diagnostic criteria is tremendous. The number of patients becomes double and more than half of the population of aged over 30 in Japan is labeled as hypertensive. The undiagnosed population increases from 22.30% up to 50%. Blood pressure controlled fraction of treated patients decreased from about 60% to 20%. This change will add a large new treatment burden to medical facility and financial burden to social insurance.

Health, Labor and Welfare, Research on the technology assessment of hypertension arrangement (No. H12-Iryo-002) and Research on the promotion and evaluation of Healthy Japan 21 (No. H12-Kenko-003).

Notes

1. National Nutrition Survey
   300 living area was randomly selected based upon area of the Comprehensive Survey of Living Condition of the People on Health and Welfare. Interview, blood pressure anthropometrical measurement and bloody chemistry test were performed on each person. Blood pressure was measured by auscultation using a mercury sphygmomanometer. As a rule, measurements were taken from the right arm with the subjects. If the first measurement values were outside the normal range, the measurements were repeated. Sample number is 17986 in 1990 and 12763 in 1999. Survey stated in 1951 and to include hypertension treatment status after 1986.

2. The National Survey of Circulatory Disorders
   The National Survey of Circulatory Disorders was done about every ten years 1971, 1980,1990, 2000; the most recent available data was 1990. A Nation wide random sample aged over 30 was taken from the chosen 300 living areas based upon the areas defined by the Comprehensive Survey of Living Condition of the People on Health and Welfare. New interview questions was added to ask the past history and treatment of circulatory disease in addition to the nutrition survey. Sample size was 10956 in 1990.

3. National Patient Survey
   Patient Survey has been done since 1953. After 1984, survey was done every 3 years with larger sample size. Particular, after 1993, sample was increased up to 70%. Survey consists of two parts. First part is to measure the prevalence of in-patient and outpatient by one-day survey. Second part is as the discharge survey during the month of September.   20% of hospitals and 5% of clinics were selected using a random sample of prefecture in 1990. The survey consisted of age and sex, visit interval, age and sex, main diagnosis and sub diagnosis.

3. Diagnostic Criteria
   The old diagnostic criteria of WHO listed below has been used for a long time until recently [16,17,18]. Japanese Ministry of Health & Welfare and Japanese Medical Association developed the first guideline based on the WHO criteria in 1990 under the recommendation of Ministry of Health & Welfare. The Japanese Society of Hypertension developed new guideline based on new WHO criteria in 2000 [19,20] and the sixth report of the joint National committee on Prevention, Deletion, Evaluation, and Treatment of high blood pressure (JNC-VI)[22].

Old criteria by old WHO Guideline

	Systolic Pressure (mmHg)		Diastolic Pressure (mmHg)
Borderline	140-159	or	90-94
Hypertension	≥ 160	or	≥ 95

Diagnostic Criteria: JSH (2000), JNC-VI (1997), WHO/ISH (1999)

JCH Criteria (JNCVICriteria, WHO/ISH)	JSH (2000) JNC-VI (1997)			WHO/ISH (1999)		
	Systolic Pressure (mmHg)		Diastolic Pressure (mmHg)	Systolic Pressure (mmHg)		Diastolic Pressure (mmHg)
High Normal (High Normal)	130 – 139	or	85-89	130 – 139	or	85-89
Mild Hypertension (Hypertension stage1, grade1)	140 – 159	or	90-99	140 – 159 subgroup: borderline: 140-149	or	90-99 subgroup: borderline: 90-94
Moderate Hypertension (Hypertension stage2, grade2)	160 - 179	or	100 – 109	160 - 179	or	100 – 109
Severe Hypertension (Hypertension stage3, grade3)	≧180	or	≧110	≧180	or	≧110

References

1. Okayama A, Kita Y, Ueshima H. Hypertension as a risk factor for cardiovascular disease, finding from epidemiological studies. *Sogo Rinsho*, 1997;46: 1695-1701 (in Japanese).
2. Farnett L, Mulrow CD, Linn WD, Lucey CR, Tuley MR. The J-curve phenomenon and the treatment of hypertension. Is there a point beyond which pressure reduction is dangerous? *JAMA*, 1991;:489-495.
3. Kimura Y, Fukiyama K. Comprehensive management of hypertension, epidemiology of hypertension in Japan. *Junkanki-ka*, 1999;46:152-163 (in Japanese).
4. Saito S, Ohnishi H, Takagi S, Shimamoto K. Epidemiology of hypertension in Japanese. *Nippon Rinsho (Jpn J Clin Med)*, 2000;58:593-596 (in Japanese).
5. Baba S, Pan WH, Ueshima H, et al. Blood pressure levels, related factors, and hypertension control status of Japanese and Americans. *J Hum Hypertens*, 1991;5:317-332.
6. Saruta T. The Japanese new guideline for the management of hypertension, Background of its preparation and characteristics of the new guideline. *Nippon Rinsho (Jpn J Clin Med)*, 2001;59:837-840 (in Japanese).
7. Fujishima M. Management of hypertension in Japan current state and clinical issue. *Nippon Rinsho (Jpn J Clin Med)*, 2001;59:892-899 (in Japanese).
8. Guidelines Subcommittee of the Japanese Society of Hypertension. *Japanese Society of Hypertension Guidelines for the Management of Hypertension*. Tokyo, 2000 (in Japanese).
9. Statistics and Information Department, Minister's Secretariat, Ministry of Health Welfare and Labor. *Patient Survey 1999 Report*. Tokyo, 1999 (in Japanese).
10. Kyoto City Institute of Health and Environmental Sciences. Status of access to medical services for hypertensives in Kyoto City based on patient's survey in 1990. *Annual Report of Kyoto City Institute of Health and Environmental Sciences*, 1995;61:96-101 (in Japanese).
11. Saito I, Takeshita E, Hayashi S, et al. Comparison of clinic and home blood pressure levels and the role of the sympathetic nervous system in clinic-home differences. *Am J Hypertens*, 1990;3:219-224.

12. Saito I , Takeshita E, Murata K, Kawabe H, Saruta T. Serum cortical in the white-coat phenomenon. *Blood Press Monit*, 1996;1:381-383.
13. Saito I, Murata K, Tsujioka M, Kawabe H, Saruta T. Long-term changes in clinic blood pressure in patients with white-coat hypertension. *Blood Press Monit*, 1998;3:97-100.
14. Staessen JA, Fagard RH, Lijnen PJ, et al. Mean and Range of the ambulatory pressure in normotensive subjects from a meta-analysis of 23 studies. *Am J Cardiol*, 1991;67:723-727.
15. Staessen JA, O'Brien ET, Atkins N, Amery AK. Short report, Ambulatory blood pressure in normotensive compared with hypertensive subjects. The Ad-Hoc Working Group. *J Hypertens*, 1993;11:1289-1297.
16. Glen SK, Elliott HL, Curzio JL, Lees KR, Reid JL. White-coat hypertension as a cause of cardiovascular dysfunction. *The Lancet,* 1996;7:348:654-657.
17. Ohkubo T, Imai Y. Ohasama study. *Ketsuatsu,* 2000;7:457-462 (in Japanese).
18. MacMahon S, Peto R, Cutler J, et al. Blood pressure, stroke, and coronary, heart disease, Part 1. Prolonged differences in blood pressure, prospective observational studies corrected for the regression dilution bias. *The Lancet,* 1990:31;335:765-774.
19. WHO Expert Committee. *Arterial Hypertension.* WHO Technical Report Series, 1978:628.
20. Guidelines for Management of Mild Hypertension. *Memorandium from a WHO/ISH meeting.* ISH hypertension special edition, 1993.
21. Anonymous. 1999 World Health Organization-international Society of hypertension guidelines for the management of hypertension. *J Hypertens* 1999;17:151-183.
22. Anonymous. The sixth report of the Joint National Committee on Prevention Detection, Evaluation, and Treatment of High Blood Pressure. *Arch Intern Med* 1997;157:2413-2446.

Chart 1

Hypertensive Population Estimate
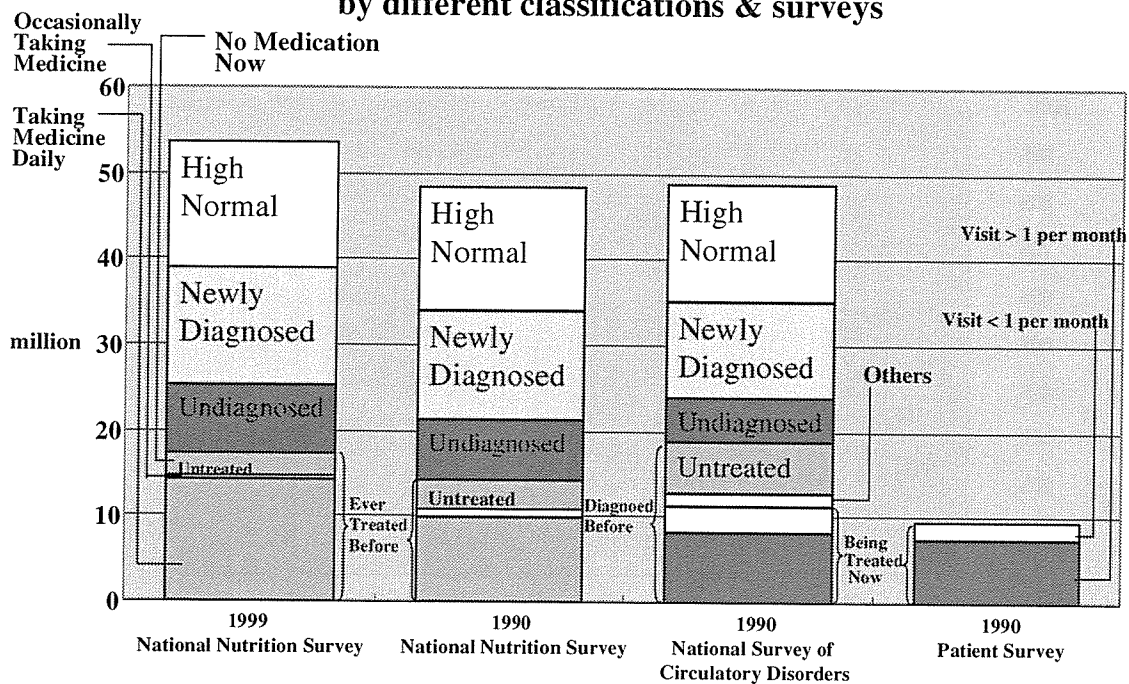### by different classifications & surveys

Occasionally Taking Medicine — ┌ No Medication Now

Taking Medicine Daily

| | 1999
National Nutrition Survey | 1990
National Nutrition Survey | 1990
National Survey of
Circulatory Disorders | 1990
Patient Survey |

million — 60, 50, 40, 30, 20, 10, 0

High Normal · Newly Diagnosed · Undiagnosed · Untreated · Ever Treated Before · Diagnosed Before · Others · Being Treated Now · Visit > 1 per month · Visit < 1 per month

Chart 2

Comparative Estimate of Hypertensive Patients
by 10 year age, sex group & visit per month

Population — Male

National Survey of Circulatery Disorders 1990

Patient Survey1990

3,000,000 · 2,500,000 · 2,000,000 · 1,500,000 · 1,000,000 · 500,000 · 0

30-39   40-49   50-59   60-69   70-   Age

Population — Female

Visit per month ≥1
Visit per month <1

3,000,000 · 2,500,000 · 2,000,000 · 1,500,000 · 1,000,000 · 500,000 · 0

30-39   40-49   50-59   60-69   70-   Age

- 11 -

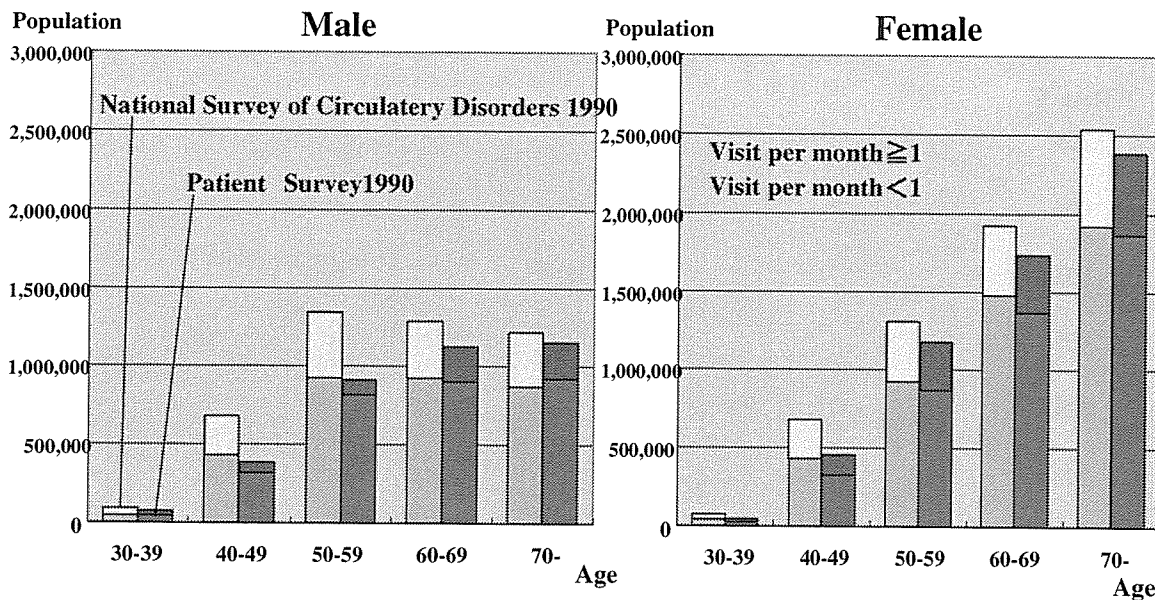**Chart 3** **Hypertensive Population Rate**

**by 5 years & sex group, by old & new diagnostic criteria
with 95% confidence interval**

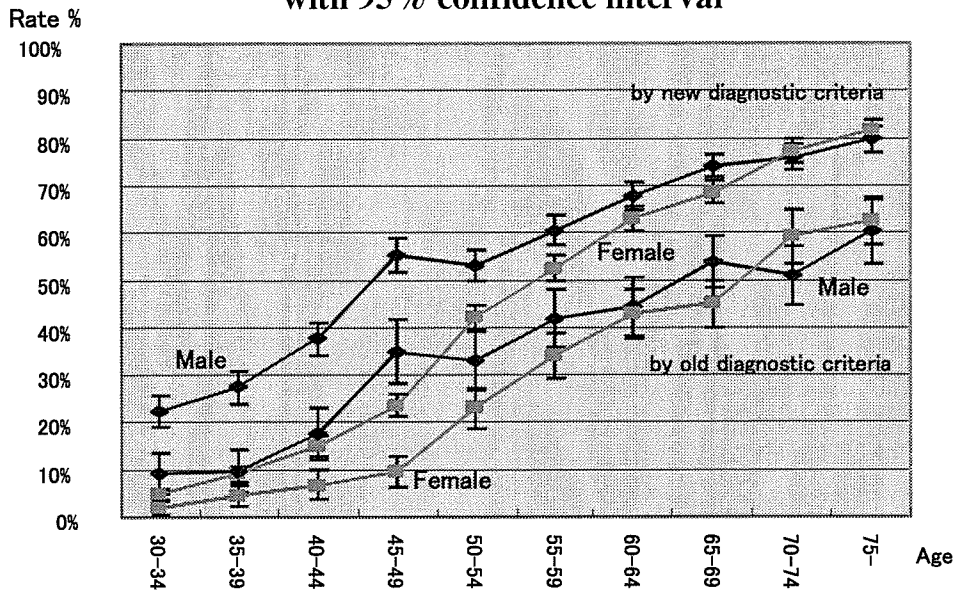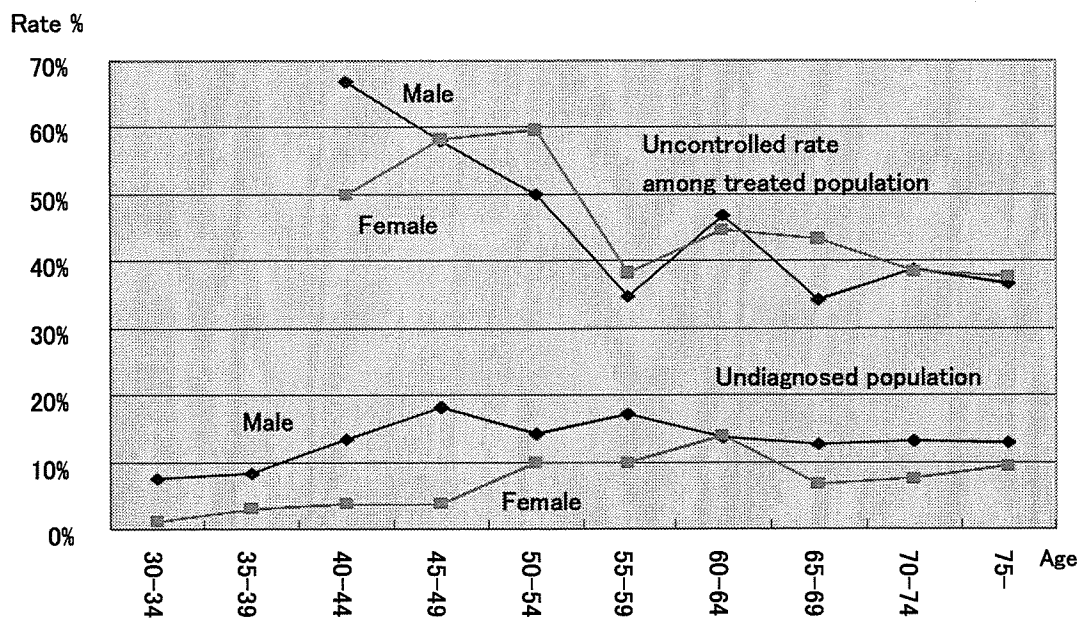Rate %

Chart 4 **Undiagnosed and Uncontrolled Rate**

by 5 years & sex group, by old diagnostic criteria

Rate %

日本の高血圧の現状と歴史推移に関する分析

長谷川　敏彦、池田　奈由

1．研究の背景と目的

　高血圧症は、今日の日本の国民にとって最も重要な疾患の一つである。その理由は、死因の大きな割合を占める心疾患や脳卒中の原因疾患であること、特に、高齢化とともに近年急増しつつある寝たきりや痴呆等の主な原因であることである。また、高血圧患者の数は他の疾患の群を抜いて多く、1962 年の世界保健機関(WHO)による血圧の旧分類でも成人人口の 3 分の 1 に上るとされ、日本の予防システムと治療システムの双方にとって大きな負荷の一端をなしている。更に、高血圧の治療費は、国民医療費の中でも大きな割合を占めている。近年では、更に 1999 年に WHO/ISH による新定義、米国 JNC-VI による新定義、そして 2000 年に日本高血圧学会ガイドラインによる新定義が発表され、極めて多数の高血圧患者が新たに生み出されるに至った。このような背景の下で、高血圧対策を策定するに当たっては、まず患者数や治療実態、そして歴史的動向を把握する必要がある。そこで本稿では、第一に日本の高血圧人口を推定し、現状と過去 20 年間の変遷を分析すること、第二に新定義による高血圧患者数の増減を検証することの二つを目的とした。

2．研究方法

1）データと対象
　1980 年、1990 年、2000 年度における循環器疾患基礎調査個票データを用いた。循環器疾患基礎調査は、日本における成人の循環器疾患とその危険因子の現状を把握し、予防対策に資することを目的として、全国の満 30 歳以上の者を対象に、厚生労働省によって 10 年周期で実施されている。調査項目には、既往歴とその治療状況等、食事・運動療法を受けたかどうか、血圧測定、血液検査、心電図検査の受診状況等、生活習慣（食生活等の変容、喫煙、飲酒、運動習慣に関する意識）、身長、体重、血圧測定、血液検査、尿検査、心電図検査、歩行数、血圧降下薬、喫煙習慣、飲酒習慣がある。
　集計対象者は、性別と年齢、血圧測定値、高血圧既往の有無、血圧降下薬服用経験の有無に関するデータがすべて利用可能なケースとした。1990 年度は 8,421 人（男性 3,510 人、女性 4,911 人）、2000 年度は 5,460 人（男性 2,231 人、女性 3,229 人）であった。ただし、1980 年度については、血圧降下薬服用経験の有無に関するデータが、高血圧既往が有るケースのみについて利用可能であったため、高血圧既往がない者は血圧降下薬を服用したことがないと仮定し、10,864 人（男性 4,779 人、女性 6,085 人）を集計対象者とした。

2）定義
　本研究では、「高血圧の既往がある」者と、「高血圧の既往はない」が血圧測定値が一定の基準値以上の者を、「高血圧患者」として定義した。基準値については、1962 年の世界保健機構(WHO)による 160/95mmHg を旧基準とし（表 1）、2000 年の日本高血圧学会(JSH2000)による 140/90mmHg を新基準とした。更に、JSH2000 では 130/85mmHg 以下を「正常血圧」、130～139/85～89mmHg を「正常高値」、140～159/90～99mmHg を「軽症高血圧」、160～179/100～109mmHg を「中等度高血圧」、180/110mmHg 以上を「重症高血圧」と定義しており（表 2）、これらの分類も用いた。

3）集計方法

　性・5歳階級別に各分類のサンプル数の割合を人口に乗じ、人口レベルの高血圧分布を求めた。高血圧の分類は、まず集計対象者を既往の「有」「無」によって分類した。「既往あり」については、血圧降下薬服用状態によって「毎日服用」または「時々服用」を「服用あり」とし、「服用中止」、「服用したことがない」に分類した。更に、各分類を血圧測定値によって「160/95mmHg 以上」と「160/95mmHg 未満」に分類した。「既往なし」については、血圧測定値が 160/95mmHg 以上の者を「未発見」、残りを JSH2000 に基づき「軽症高血圧」と「正常高値」、「正常血圧」へ分類した。

3．研究結果・考察

1）30歳以上高血圧人口の変遷

　旧定義による 30 歳以上高血圧人口（30 歳以上人口に占める割合）は、1980 年に 1770 万人（27.6％）、1990 年に 2170 万人（29.4％）、2000 年に 2540 万人（31.0％）であった(表 3、図 1)。

　未発見（30 歳以上高血圧人口に占める割合）は、1980 年に 530 万人（29.8％）、1990 年に 590 万人（27.3％）、2000 年に 550 万人（21.6％）であった。

　「服用あり」（30 歳以上高血圧人口に占める割合）は、1980 年に 680 万人（38.4％、毎日服用 524 万人）、1990 年に 920 万人（42.4％、毎日服用 850 万人）、2000 年に 1390 万人（54.7％、毎日服用 1350 万人）であった。「服用中止」（30 歳以上高血圧人口に占める割合）は、1980 年に 170 万人（9.5％）、1990 年に 240 万人（11.0％）、2000 年に 130 万人（5.3％）であった。また、「服用したことがない」（30 歳以上高血圧人口に占める割合）は、1980 年に 400 万人（22.4％）、1990 年に 420 万人（19.3％）、2000 年に 470 万人（18.4％）であった（表 3）。

2）新定義による高血圧患者の増減

　2000 年において、JSH2000 血圧新分類により、1100 万人が軽症高血圧として分類され、高血圧患者が 30 歳以上人口に占める割合は、旧定義での 31.0％から 44.4％へ上昇するに至った。更に、正常高値に分類された 1290 万人を加えると、30 歳以上人口の 60.1％を占める（表 3）。

4．考察・結論

　過去 20 年間に、高血圧患者数は約 1.4 倍に増加したが、未発見者数は大きく変化しなかったため、未発見率は低下した。また、高血圧患者の治療率は上昇しており、全体として高血圧対策は改善しつつあるといえる。

　ただし、2000 年のみに注目すると、高血圧患者のうち 470 万人が血圧降下薬を一度も服用したことがなく、130 万人が服用を中止し、40 万人が時々しか服用しておらず、治療のコンプライアンスが大きな課題である。

　JSH2000 により、1100 万人が新たに高血圧患者に加わり、30 歳以上人口の 44％が高血圧患者となるに至った。しかしながら、旧定義において依然として 600 万人の未治療・治療中止者や 510 万人の非管理者、550 万人の未発見者が存在しており、これらの管理の改善が急務である。この点を考慮した現実的なガイドラインの改訂が必要とされている。

学会発表

長谷川敏彦，池田奈由：日本の高血圧の現状と歴史推移に関する分析．第26回日本高血圧
学会総会（宮崎ワールドコンベンションセンターサミット）．第26回日本高血圧学会抄録
集（日本高血圧学会編）p159，2003．

図表

表1　　高血圧の分類（1962年　WHO）

	収縮期血圧（mmHg）		拡張期血圧（mmHg）
正常血圧	<140	かつ	<90
境界域血圧	140〜159	または	90〜94
高血圧	≧160	または	≧95

表2　　血圧の分類（2000年　日本高血圧学会）

	収縮期血圧　（mmHg）		拡張期血圧(mmHg)
至適血圧	<120	かつ	<80
正常血圧	<130	かつ	<85
正常高値	130〜139	または	85〜89
軽症高血圧	140〜159	または	90〜99
中等度高血圧	160〜179	または	100〜109
重症高血圧	≧180	または	≧110

表3　1980、1990、2000年の日本における30歳以上高血圧患者の診療・血圧管理状態*

	1980	1990	2000
高血圧（旧定義）	17.7	21.7	25.4
既往あり	12.4	15.8	19.9
服用あり（毎日・時々）	6.8	9.2	13.9
毎日服用	5.2	8.5	13.5
服用中止	1.7	2.4	1.3
服用したことがない	4.0	4.2	4.7
未発見	5.3	5.9	5.5
軽症高血圧	11.3	12.3	11.0
正常高値	10.5	12.7	12.9
正常血圧	24.5	27.0	32.7
30歳以上人口	64.0	73.7	81.9

*　単位：百万人

図1　30歳以上高血圧人口推移

循環器疾患基礎調査1980,1990,2000
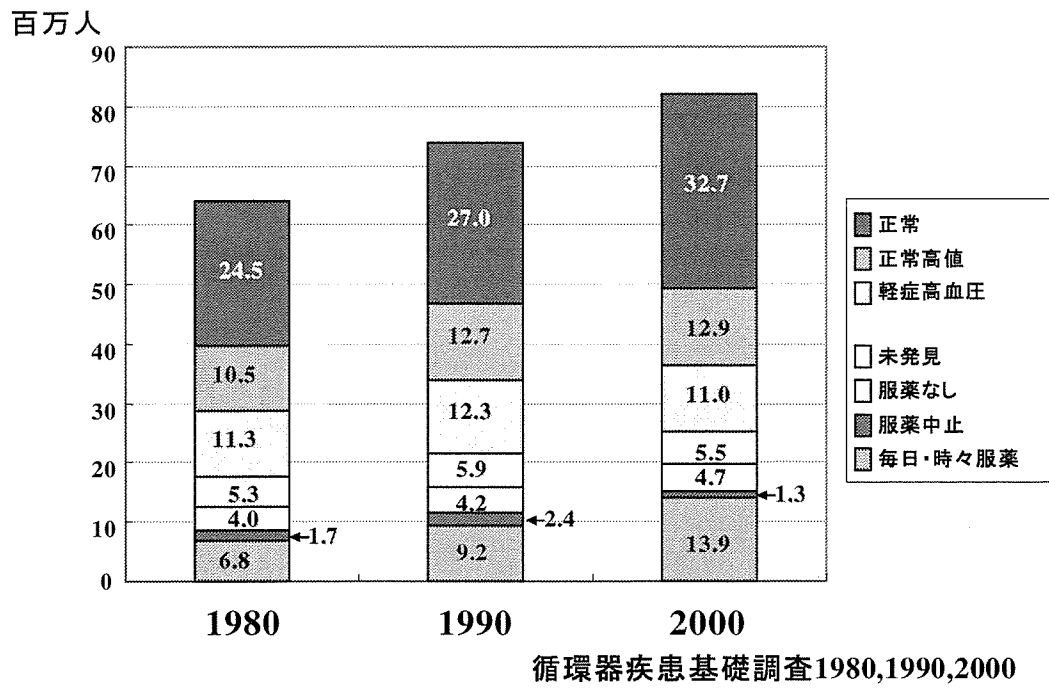
日本のシンドロームX患者数と血圧状態推計の試み

池田 奈由、長谷川 敏彦

1．研究目的

　高齢化に伴い、生活習慣病の管理が健康日本 21 政策において重要とされている。特に高血圧と他のリスクを合併するシンドローム X（以後 SX）の患者については、積極的な発見と非薬物・薬物療法によるリスク管理が重要である。本研究では、現在利用可能なデータを用い SX 患者数の推計と実態の把握を試みた。

2．方法

　平成 12 年度循環器疾患基礎調査個票データ(30 歳以上男女）を用い、性・10 歳階級別に集計し全国数を推計した。また、SX 人口が 30 歳以上人口に占める割合を性・年齢階級別に比較した。更に各危険因子の既往の有無を考慮した場合と考慮しない場合とを比較し、特に血圧の管理状態を検討した。
　肥満、高血圧、高トリグリセリド血症、低 HDL‐C 血症、糖尿病の各危険因子について、「既往有り」又は「診断基準値により判定される」者をリスク保有者とし、全危険因子の保有者を SX 患者とした。診断基準値は米国 NCEP‐ATP3 に従い、血圧 130/85mmHg、トリグリセリド 150mg/dl、HDL‐C 男 40mg/dl、女 50mg/dl、血糖 110mg/dl とした。但し肥満については、腹囲データが存在しないため BMI25 とした。また、肥満の既往データは存在しないため対象外とした。

3．結果・考察

　SX 人口推定値と 95％信頼区間は、既往を考慮した場合、5149±1922 千人（男 2596±1023 千人、女 2553±899 千人）、考慮しない場合、3910±1707 千人（男 2030±919 千人、女 1880±788 千人）であった。血圧が管理されている人口が SX 人口に占める割合は 3.5％であった（図 1）。性・年齢階級別の SX 推定人口が全人口に占める割合（％）は、既往を考慮した場合、30－39 歳、40－49 歳、50－59 歳、60－69 歳、70－79 歳、80 歳以上の順に、男性が 3.0、4.2、7.6、11.0、8.3、8.3、女性が 1.0、2.2、5.3、9.7、11.7、10.7、合計が 2.0、3.2、6.5、10.3、10.3、9.9 であった。既往を考慮しない場合、同様の順に、男性が 2.7、3.9、5.5、8.3、6.7、5.6、女性が 1.0、1.3、3.3、7.1、8.8、9.7、合計が 1.9、2.6、4.4、7.7、7.9、8.4 であった（図 2）。

4．結論

　既往を含んで定義した SX 人口約 510 万人のうち、現状での約 390 万人が 76％を占め、その差 24％が一部の危険要因の管理状態を示し、SX 管理が良好ではないことが示唆される。特に血圧については管理率が極めて低いことが判明した。高血圧管理の観点から、SX 対策を再考する必要がある。更に、SX 人口が 30 歳以上人口に占める割合は男性が女性を上回ったが、70 歳台から男性は低下し一方で女性は上昇、逆転することが判明した。中壮年期の男性と高齢期の女性について特に対策が必要である。