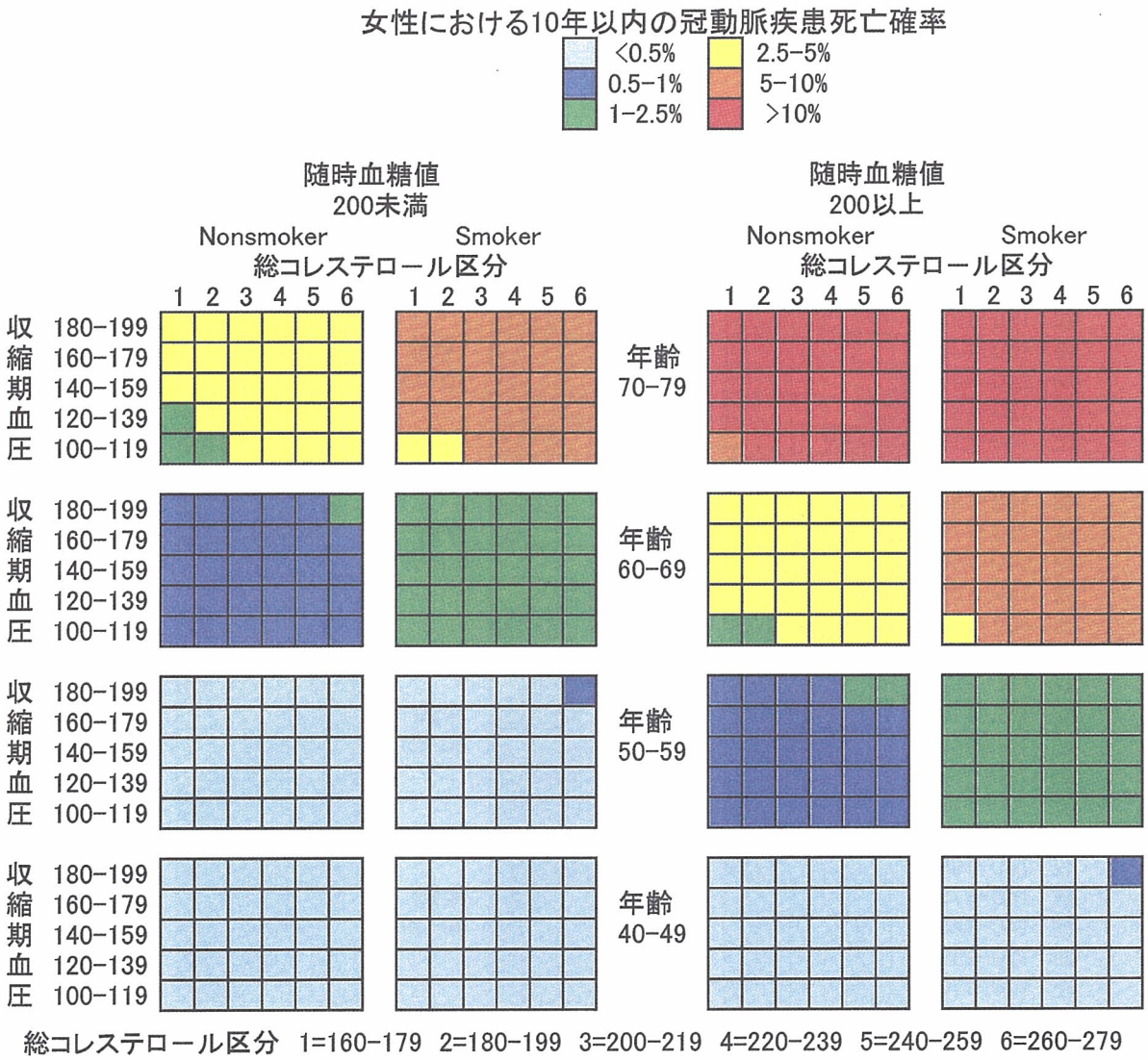

図 2. 冠動脈疾患健康度評価チャート－女性－

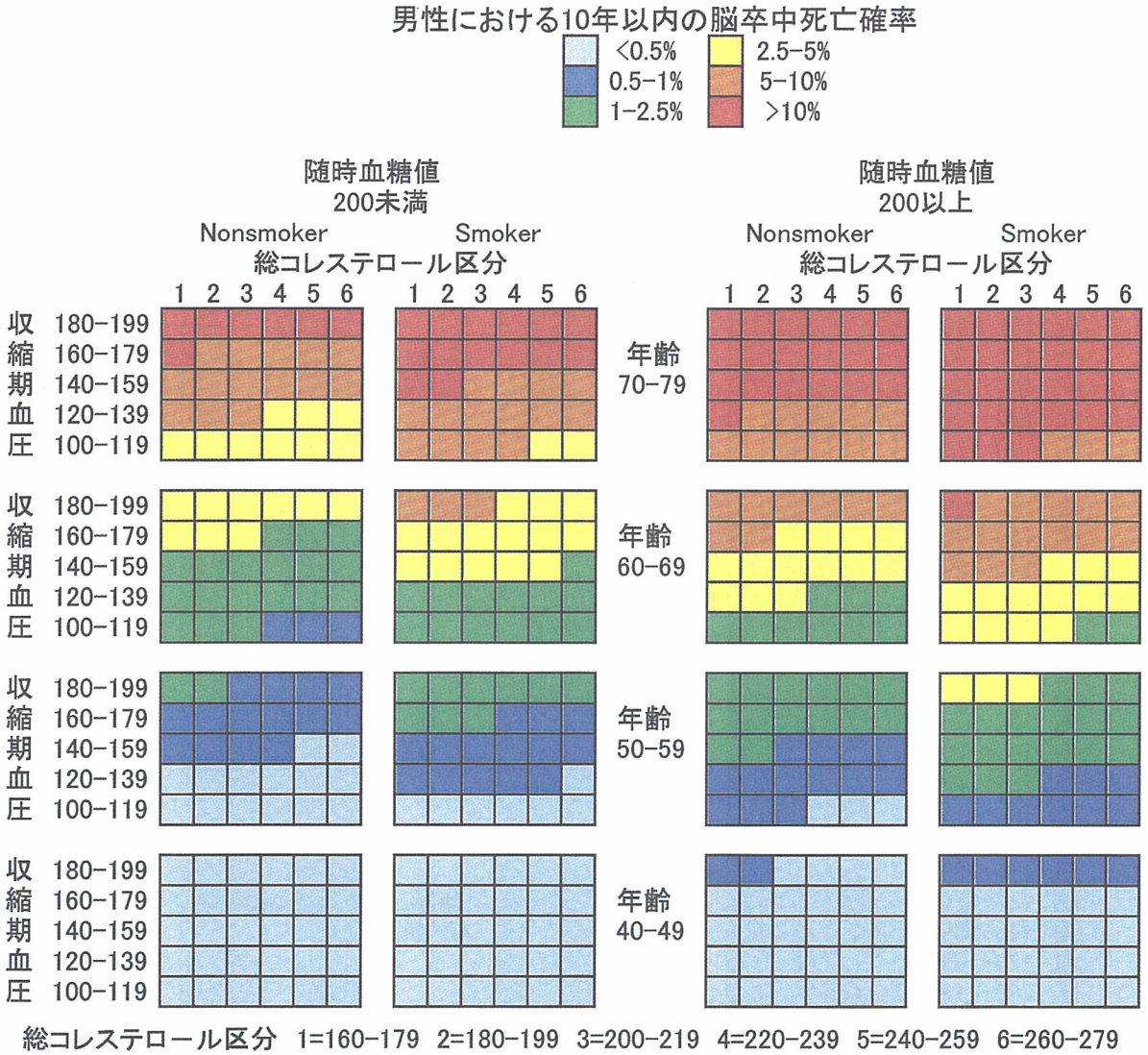

図 3. 脳卒中健康度評価チャートー男性ー

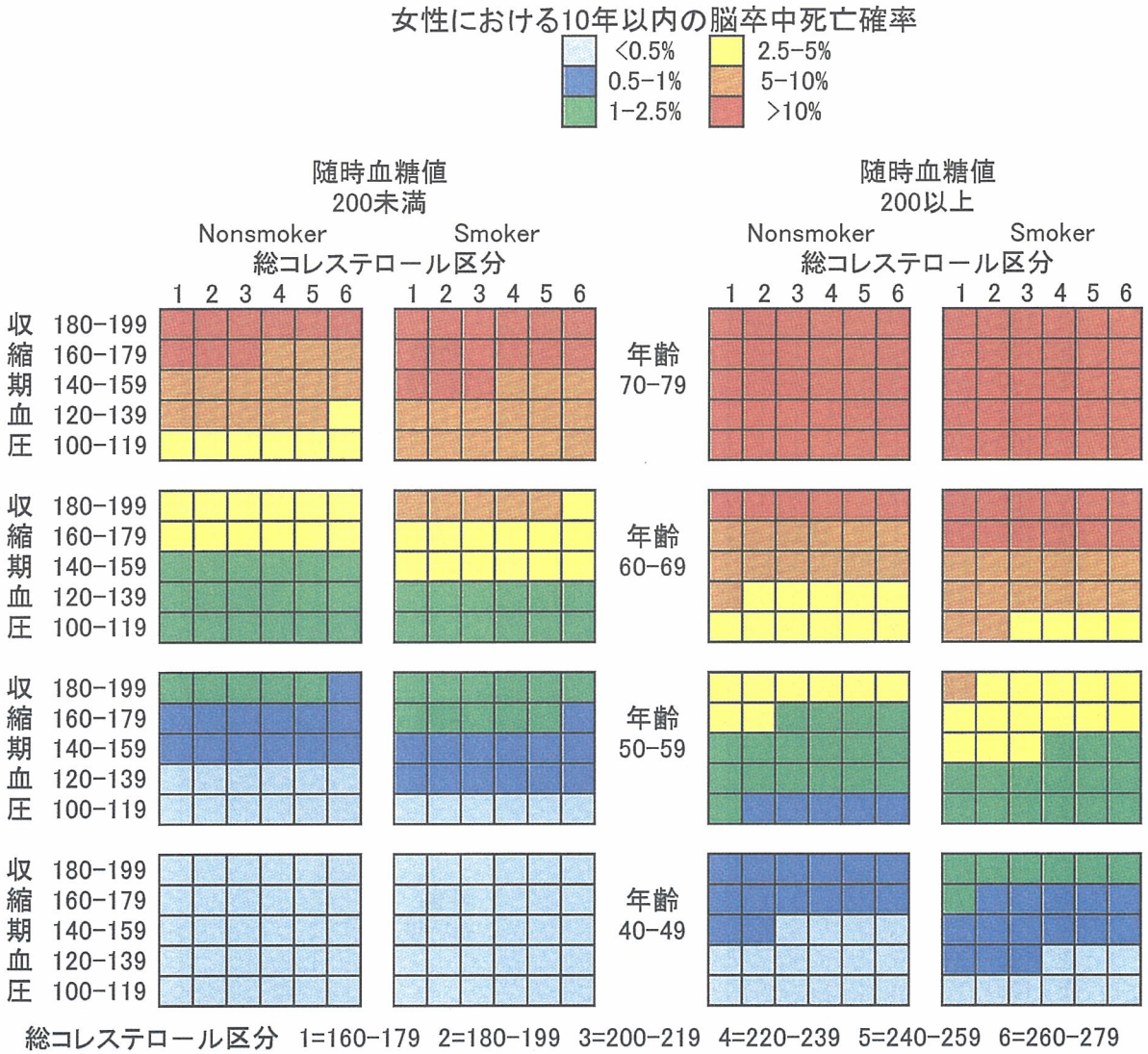

図 4. 脳卒中健康度評価チャートー女性ー

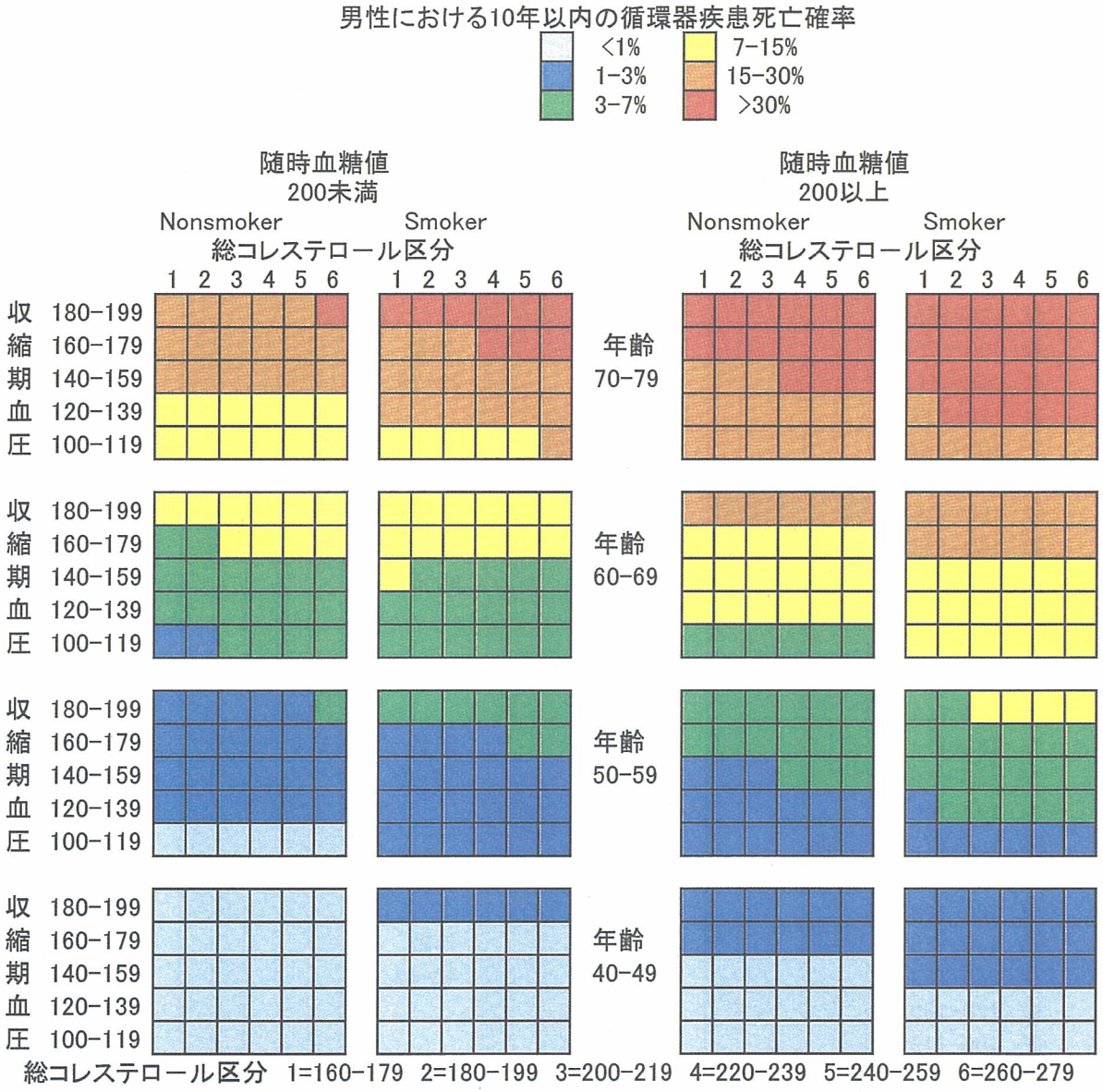

図 5. 循環器疾患健康度評価チャート－男性－

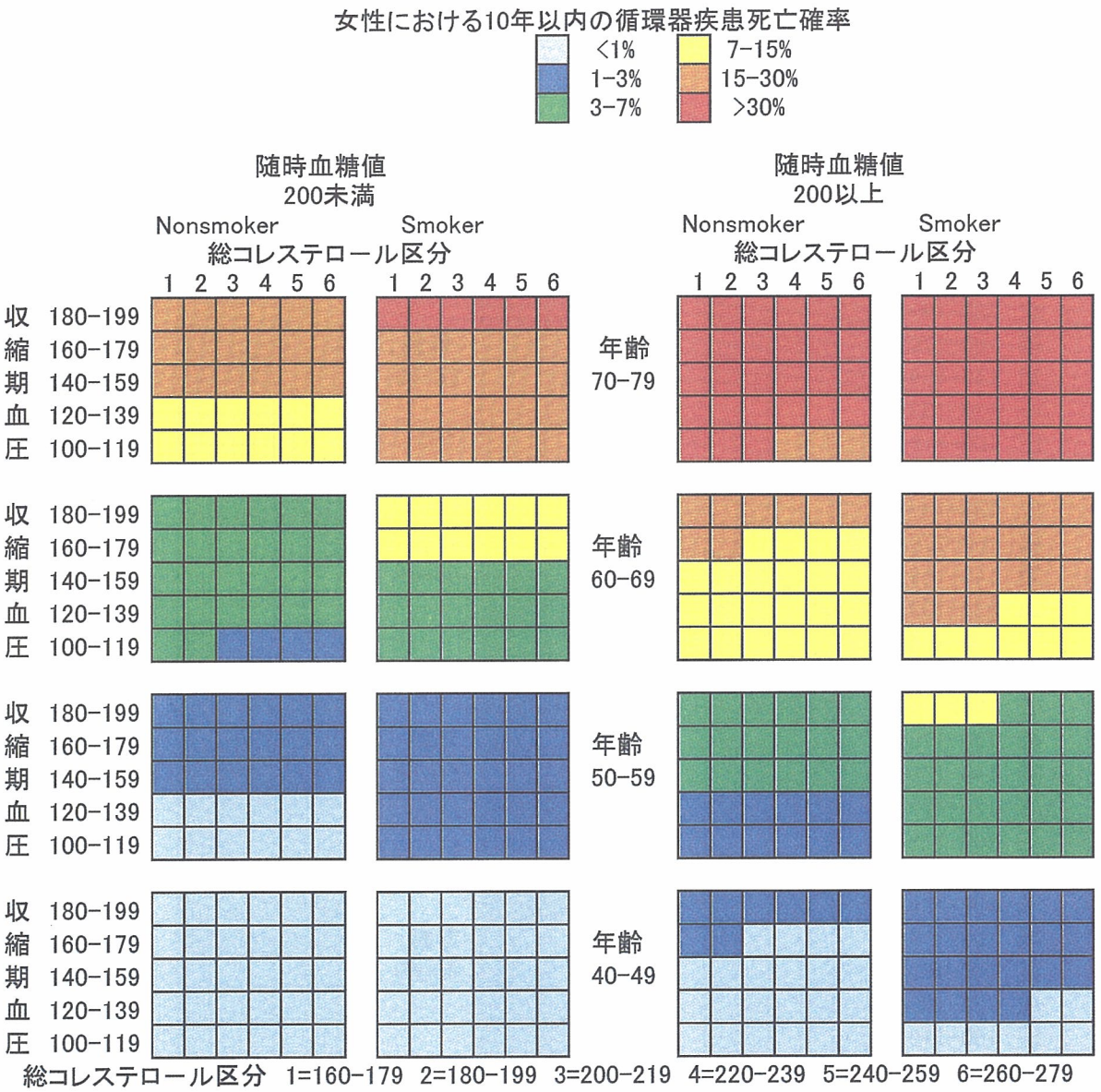

図 6. 循環器疾患健康度評価チャートー女性ー

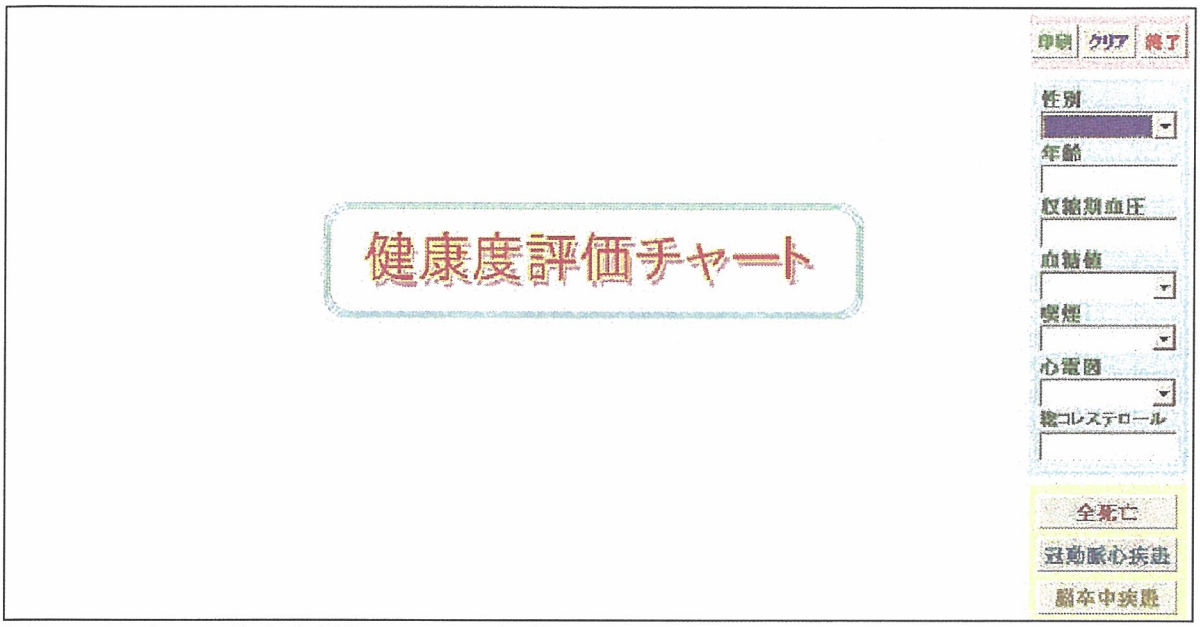

図 7. ＰＣ上での健康度評価チャ･トの起動画面

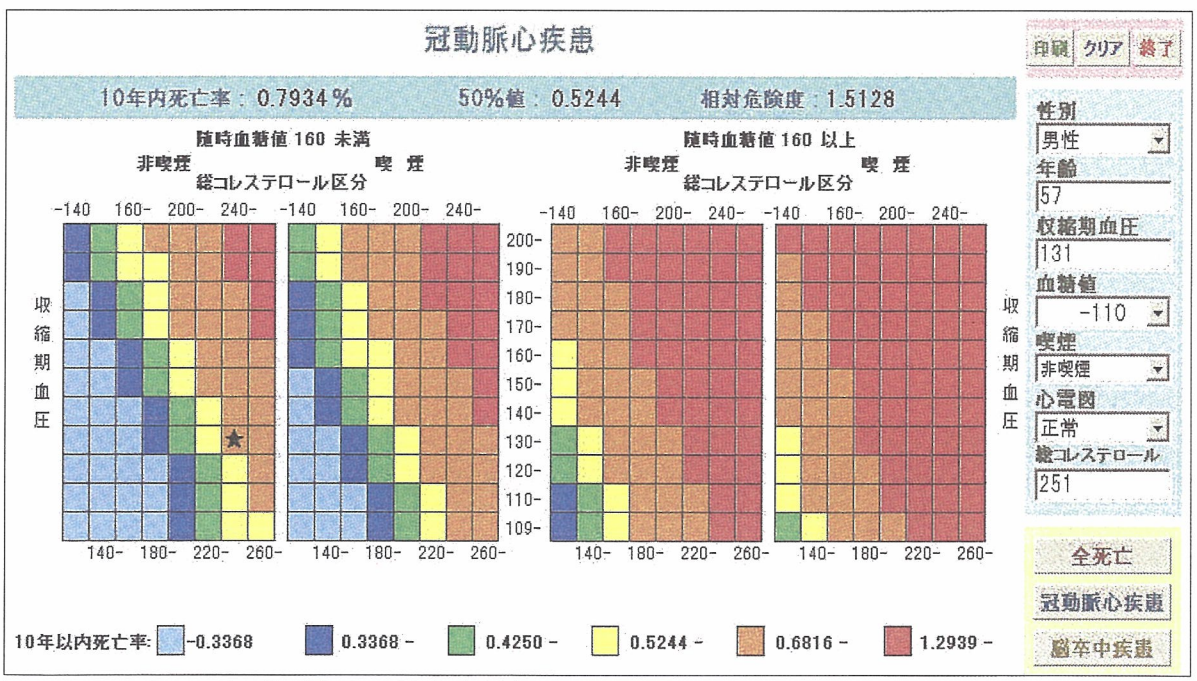

図 8. ＰＣ上での冠動脈疾患の健康度評価チャ･ト

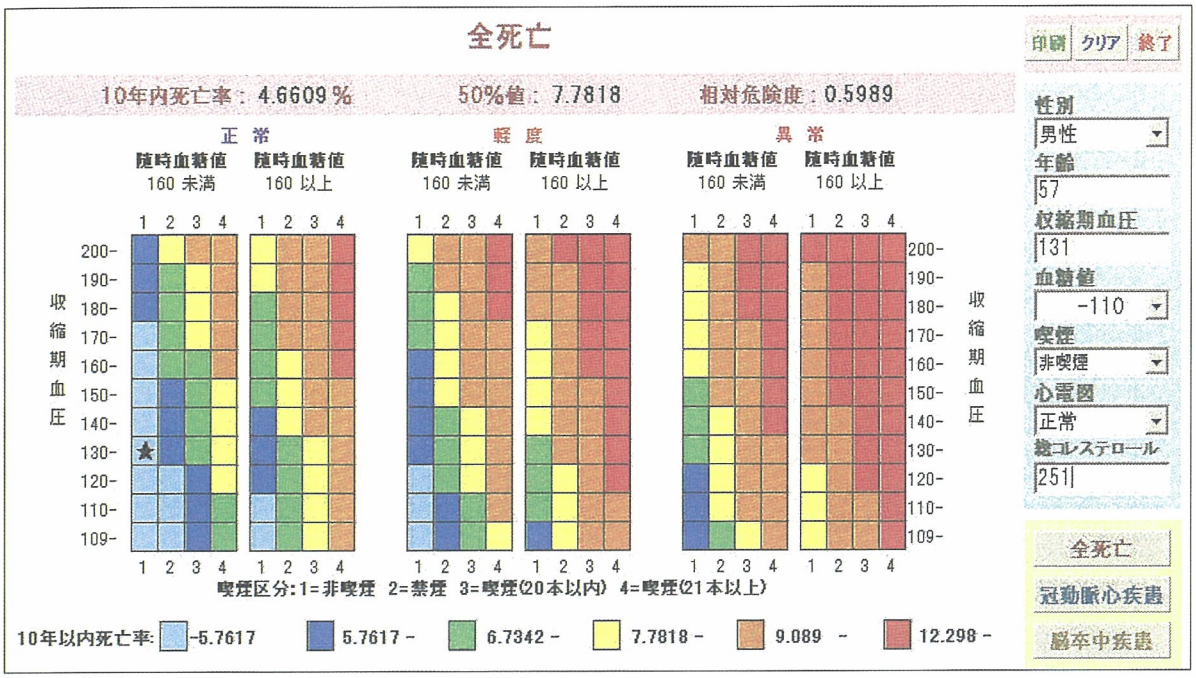

図 9. ＰＣ上での全死亡の健康度評価チャート

NIPPON DATA80 の 19 年間の追跡調査より作成した循環器疾患に対する危険度評価チャート

NIPPON DATA80 研究グループ

フラミンガム・スタディをはじめ、循環器疾患の危険因子の状態に基づき、循環器疾患への罹患危険度を評価するものが知られている。しかし、フラミンガム・スタディのスコアを用いて、国民の心筋梗塞や脳卒中発症率を予測することは、相対危険度としては可能であっても、絶対危険度としては予測することができない。そのため、わが国の疾病構造にあったものが必要であり、国民を代表する集団での健康危険度評価システムの開発が必要であった。

NIPPON DATA80 は 1980 年の循環器疾患基礎調査対象者、約 1 万人を追跡している調査であり、この 19 年間の追跡調査より、個人の循環器疾患の危険因子の状態に応じて、10 年間における心筋梗塞死亡、脳卒中死亡、全循環器疾患死亡等の確率について性別、年齢別に色分けしたチャートを作成した。ここで、10 年間の循環器疾患死亡確率の計算に用いた危険因子は、性、年齢、血圧値、血清総コレステロール値、随時採血時の血糖値、喫煙、である。

こチャートは、性別、10 歳年齢区分別に、血圧 5 群、血清総コレステロール値 6 群、喫煙の有無、糖尿病の有無別に 10 年間におけるそれぞれの循環器疾患死亡危険度が色分けして示されている。検査所見より循環器疾患死亡危険度が高くても、禁煙や血圧コントロール等により、その危険度の期待される低下が目に見える形でわかる。これらのチャートは、臨床の現場において、また、健診後の事後指導の現場において、対象者にわかりやすく予防と治療の重要性を認識してもらうための補助教材として有用であると期待している。

公表論文　NIPPON DATA80 Research Group. Circulation Journal 2006;70:1249-1255.

Circ J 2006; **70:** 1249–1255

Risk Assessment Chart for Death From Cardiovascular Disease Based on a 19-Year Follow-up Study of a Japanese Representative Population

— NIPPON DATA80 —

NIPPON DATA80 Research Group*

Background Based on the NIPPON DATA80, risk charts for the probability of death from coronary heart disease (CHD), stroke, and all cardiovascular disease (CVD) were constructed by sex and 10-year age groups.

Methods and Results The 9,638 participants were followed-up for 19 years from 1980, excluding 28 individuals without the necessary baseline data and 257 participants with past history of stroke or CHD. Final analysis was performed on 9,353 participants (4,098 men, mean age 50.3 years; 5,255 women, mean age 50.8) using a Cox proportional hazards model. Death probabilities over a 10-year period from CHD, stroke, and all CVD were calculated and displayed as color coding on each chart by combining 10-year age, systolic blood pressure, smoking, and serum total cholesterol and glucose levels. Six different colors corresponding to probabilities of death were displayed on each chart.

Conclusions The original charts based on the findings from NIPPON DATA80 are suitable for assessing CHD, stroke, and all CVD death risk in the general Japanese population. These charts should be used as a health-education tool for lifestyle modification targeting individuals with CVD risk factors. (*Circ J* 2006; **70:** 1249–1255)

Key Words: Blood pressure; Cholesterol; Coronary heart disease; Glucose; Smoking; Stroke

A 19-year follow-up study of a Japanese representative population, NIPPON DATA80, revealed that risk factors for stroke, coronary heart disease (CHD), and all cardiovascular disease (CVD) were not different from those of Western societies[1–4] although absolute risks for stroke and CHD in Japan were different[1–4] mainly due to differences in incidence and mortality from stroke and CHD.[5–10] Japanese individuals had the highest rate of stroke mortality in the world in 1965 but the lowest CHD incidence and mortality among industrialized countries.[5–10]

For assessing an individual's risk of stroke, CHD, and all CVD, Framingham CHD risk score, and New Zealand and European charts have been formulated and are now tools used in patient education.[4,11–13] However, a risk assessment chart or score for the Japanese population is necessary because of the differences in CVD morbidity and mortality.

NIPPON DATA80 is a 19-year follow-up study of mortality from stroke, CHD, and all CVD in about 10,000 representative Japanese men and women aged 30 years and older. The purpose of the present study was to construct risk-assessment charts for death from CHD, stroke, and all CVD based on NIPPON DATA80.

Methods

Population and Follow-up

Complete details of the NIPPON DATA80 study population have been described elsewhere.[1–3,14] Subjects of this cohort were participants in the 1980 National Survey on Circulatory Disorders.[1–3] A total of 10,546 community-based subjects aged 30 years and older in 300 randomly selected health districts throughout Japan participated in the survey. The survey consisted of history-taking, physical examinations, blood tests, and a self-administered questionnaire on lifestyle, including an essential nutrition survey using the food-frequency method. The overall population aged 30 years and older in the 300 participating health districts was 13,771, and the participation rate in the survey was 76.6% (10,546/13,771), before exclusion for the reasons below. We were able to follow-up 9,638 participants for 19 years, excluding 28 individuals without the necessary baseline data and 257 participants with a past history of stroke or CHD. Thus, we analyzed data from 9,353 participants (4,098 men, mean age 50.3 years; 5,255 women, mean age 50.8) for this study.

To determine cause of death in participants whot died during follow-up, we used the National Vital Statistics. In accordance with Japan's Family Registration Law, all death certificates issued by physicians are forwarded to the Ministry of Health and Welfare via the public health centers in the district of residency. Underlying causes of death were coded according to the 9th International Classification of Disease for the National Vital Statistics until the end of 1994, and according to the 10th International Classification of Disease from the beginning of 1995.[15] We confirmed deaths in each district by computer-matching of data from the Vital Statistics database, using the district, sex, and dates of birth and death as key codes.

Permission to use the National Vital Statistics was obtained from the Management and Coordination Agency, of

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**Members of the research group are listed in the Appendix 1.*

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Table 1 Baseline Characteristics of the Study Subjects in 1980, Number of Death From Stroke, Coronary Heart Disease and All Cardiovascular Disease During 19-Year Follow-up, NIPPON DATA80

	Men	Women
No. of subjects	4,098	5,255
No. of deaths from stroke	162	150
No. of deaths from coronary heart disease	67	65
No. of deaths from all cardiovascular disease	339	339
Age (years)	50.3±13.1	50.8±13.3
Systolic blood pressure (mmHg)	138.4±20.8	133.9±21.4
Total cholesterol (mg/dl)	186.1±32.7	190.8±34.1
Blood glucose (mg/dl)	101.0±32.4	99.6±28.7
% of those having glucose ≥200 mg/dl	1.61	1.16
Smoker (%)	63.3	8.8

the national government of Japan. Approval for this study regarding ethics issues was obtained from the Institutional Review Board of the Shiga University of Medical Science (No. 12–18, 2000).

Biochemical and Baseline Examinations

Baseline examinations were conducted by public health centers. Baseline systolic and diastolic blood pressures (SBP, DBP) were measured by trained operators using a standard mercury sphygmomanometer on the right arm of seated subjects after at least 5 min of rest.

Subjects were asked to note whether they were current smokers, had quit smoking, or had never smoked. Smokers were asked to note the number of cigarettes smoked each day. Non-fasting blood samples were drawn and centrifuged within 60 min of collection, and then stored at −70°C until analyses. Total cholesterol was analyzed in a sequential auto-analyzer (SMA12/60; Technicon, Tarrytown, NY, USA) at a single laboratory (Osaka Medical Center for Health Science and Promotion), which is a member of the Cholesterol Reference Method Laboratory Network (CRMLN);[16] and the precision and accuracy of the measurements of serum cholesterol were certified in the Lipid Standardization Program administered by the Centers for Disease Control and Prevention, Atlanta. Serum concentration of glucose was measured by the cupric-neocuproine method![17] Original glucose values obtained by the cupric-neocuproine method were converted to those of the glucose-oxidase method, which is currently the standard, by use of an equation reported by the same laboratory![18] Diabetes mellitus (DM) was defined as a serum glucose concentration ≥200 mg/dl.

Statistical Analysis

Complete details of the statistical methods are reported elsewhere![19] The outcome event used in the present study was cause-specific death from stroke, CHD, and all CVD. A Cox proportional hazards model was used to determine the probability of death of those with risk factor x at baseline. Survival probability $S(t:x)$ at the time t for risk factor x in the Cox regression analysis is given as the following: $S(t:x)=[S_0(t:\bar{x})]^{\exp(\beta(\bar{x}-x))}$, where $\bar{x}$ is population mean of risk factor x, and $S_0(t:\bar{x})$ is survival probability for those with risk factor $\bar{x}$. The 10-year probability of death for risk factor x was calculated by the following equation: $1-S(10:x)$.

We constructed risk assessment charts for 10-year probability of death due to CHD, stroke, and all CVD in both men and women using traditional risk factors (ie, SBP, smoking habit, serum total cholesterol and serum glucose). SBP was classified into 5 categories: (1) 100–119 mmHg, (2) 120–139 mmHg, (3) 140–159 mmHg, (4) 160–179 mmHg and (5) 180–199 mmHg. Smoking was divided into 2 categories: non-current smoker and current smoker. Serum total cholesterol was classified into 6 categories: (1) 160–179 mg/dl, (2) 180–199 mg/dl, (3) 200–219 mg/dl, (4) 220–239 mg/dl, (5) 240–259 mg/dl, and (6) 260–279 mg/dl. Casual serum glucose level was divided into 2 categories: <200 mg/dl and ≥200 mg/dl. These cut-off points were based on either practical considerations or guideline recommendations from the Hypertension Treatment Guidelines 2004 in Japan and the Treatment of Atherosclerosis in Japan![20,21] Ten-year death probabilities from stroke, CHD, and all CVD were calculated and displayed as color coding on each chart, combining 10-year age, systolic blood pressure, smoking, and serum total cholesterol and glucose levels. Six different colors were displayed on each chart corresponding to the following probabilities of death: <0.5%, 0.5–1%, 1–2%, 2–5%, 5–10% and ≥10% for CHD and stroke, and <1.0%, 1–3%, 3–7%, 7–15%, 15–30% and ≥30% for all CVD. SAS version 8.02 for Windows (SAS Institute, Cary, NC) was used for estimating a regression coefficient of, and the survival probability $S_0(t:\bar{x})$ for those with the population mean $\bar{x}$ of a risk factor.

Results

During the 19-year follow-up from 1980, the number of deaths from stroke and CHD was 312 and 132, respectively (Table 1), and death rates were 1.93 and 0.81 per 1,000 person-years. Average age for men and women at baseline was 50.3 and 50.8 years, respectively. Although SBP was higher in men than in women, serum total cholesterol was higher in women than in men (190.8 mg/dl vs 186.1 mg/dl). Prevalence of casual glucose level ≥200 mg/dl was slightly higher in men than in women (1.61% vs 1.16%). Smoking rate in men was far greater than in women, reflecting the relatively high smoking rate of Japanese men in 1980.

Table 2 Age-Specific Mortality per 1,000 Person-Years, 19-Year Follow-up, NIPPON DATA80

Age (years)	Stroke		CHD		All CVD	
	Men	Women	Men	Women	Men	Women
30–39	0.15	0.12	0.05	0.00	0.35	0.20
40–49	0.35	0.32	0.50	0.12	1.09	0.68
50–59	1.73	0.76	0.80	0.22	3.83	1.69
60–69	5.57	2.77	2.07	1.89	10.81	6.97
≥70	18.43	14.30	6.06	5.28	37.61	31.33

CHD, coronary heart disease; CVD, cardiovascular disease.

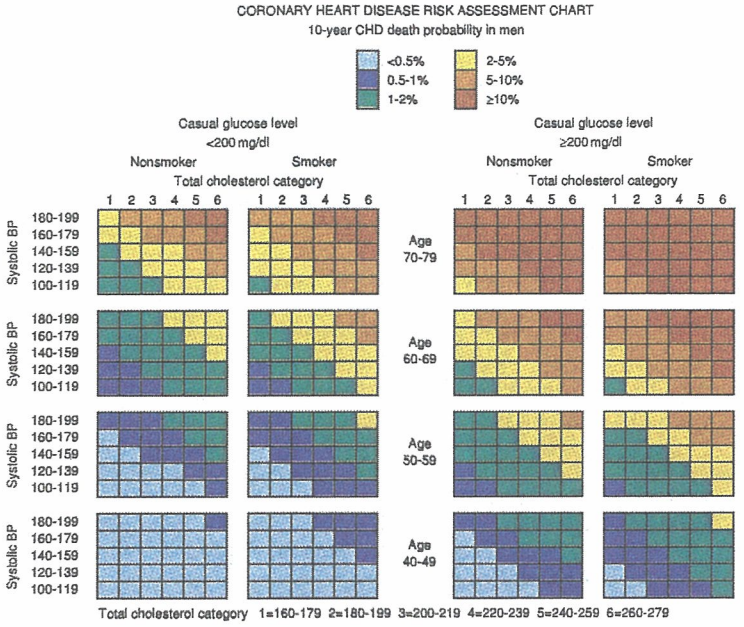

Fig 1. Risk assessment chart for 10-year probability of death due to coronary heart disease in men, NIPPON DATA80. Ten-year probability of death was calculated based on individual risk assessment using sex, age, systolic blood pressure (BP), serum total cholesterol, serum glucose and smoking habit. Someone with any of the cardiovascular disease risk factors, despite belonging to the lowest risk group (light blue) should undergo risk factor modification by non-pharmacological and/or pharmacological treatment. CHD, coronary heart disease.

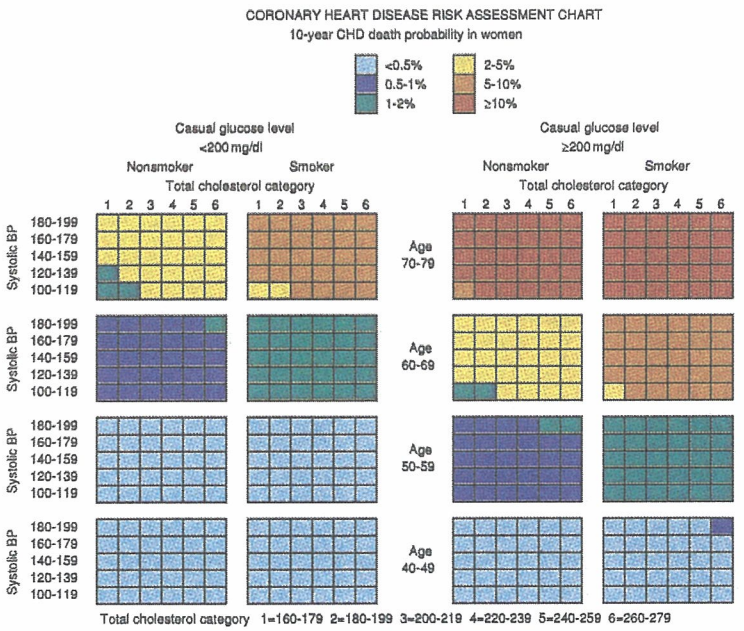

Fig 2. Risk assessment chart for 10-year probability of death due to coronary heart disease in women, NIPPON DATA80. Ten-year probability of death was calculated based on individual risk assessment using sex, age, systolic blood pressure (BP), serum total cholesterol, serum glucose and smoking habit. Someone with any of the cardiovascular disease risk factors, despite belonging to the lowest risk group (light blue) should undergo risk factor modification by non-pharmacological and/or pharmacological treatment. CHD, coronary heart disease.

Death rates for stroke and CHD by age group at entry in 1980 are shown in Table 2. Stroke death rate was around 3-fold higher than the CHD death rate among subjects aged 70 years and older. Stroke mortality for men increased with age; however, CHD mortality rate after the age of 70 years was similar for both sexes, although the mortality rate was much higher in men than in women under the age of 70.

A Cox proportional hazards model was used to determine 10-year probability of death due to CHD, stroke, and all CVD, taking into account baseline risk factors such as age, SBP, serum total cholesterol, smoking, and serum glucose. By using the coefficients from the Cox model and the 10-year death probability for mean levels of risk factors (age, smoking, total cholesterol and casual glucose), risk assessment charts were constructed for both sexes for the probability of death within 10 years from CHD, stroke, or all CVD. The 10-year probability of death was determined for various combinations of baseline risk-factor levels. Figs 1–6 show the results, with a 6-color gradient from the highest (red) to the lowest (light blue) probability of death within 10 years.

In Fig 1 for male CHD risk assessment, if a man aged 65 years had a SBP of 164 mmHg, a smoking habit, a glucose level of 210 mg/dl, and a serum total cholesterol of 240 mg/dl, his CHD death probability within 10 years would be ≥10%, as shown in red. If this subject quit smoking without any other risk factor changes, his CHD death probability would be <10%, as shown by the yellow-brown color.

The chart for 10-year stroke death probability was some-

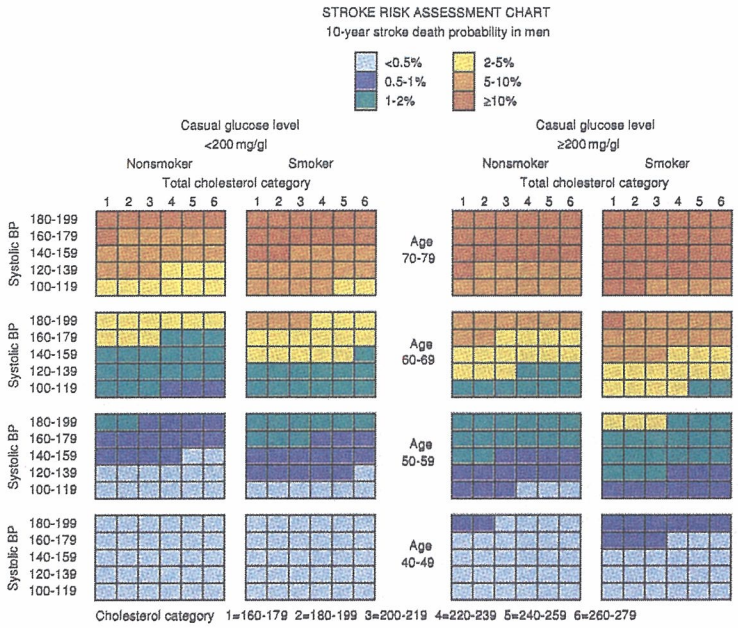

Fig 3. Risk assessment chart for 10-year probability of death due to stroke in men, NIPPON DATA80. Ten-year probability of death was calculated based on individual risk assessment using sex, age, systolic blood pressure (BP), serum total cholesterol, serum glucose and smoking habit. Someone with any of the cardiovascular disease risk factors, despite belonging to the lowest risk group (light blue) should undergo risk factor modification by non-pharmacological and/or pharmacological treatment.

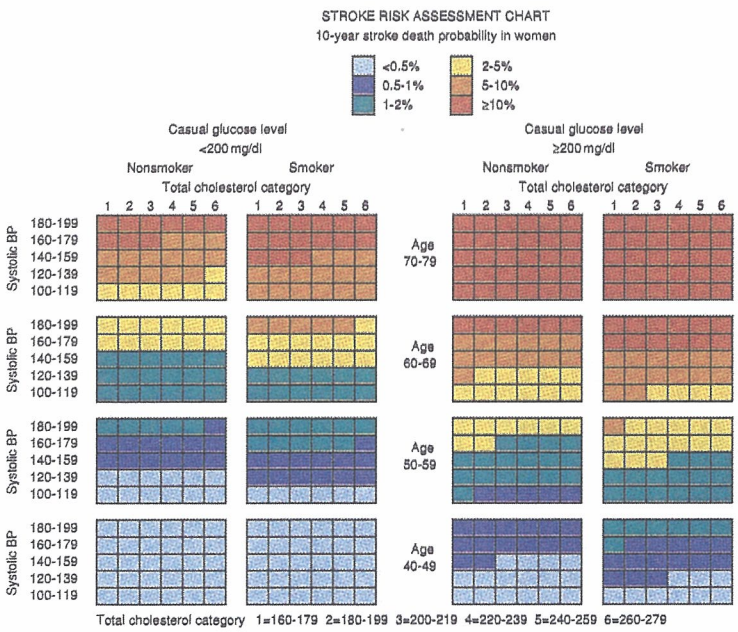

Fig 4. Risk assessment chart for 10-year probability of death due to stroke in women, NIPPON DATA80. Ten-year probability of death was calculated based on individual risk assessment using sex, age, systolic blood pressure (BP), serum total cholesterol, serum glucose and smoking habit. Someone with any of the cardiovascular disease risk factors, despite belonging to the lowest risk group (light blue) should undergo risk factor modification by non-pharmacological and/or pharmacological treatment.

what different from the CHD death probability chart for both men and women. For CHD death the color (probability) gradient continued from the lower-left to the upper-right, whereas the color gradient for stroke death was not as remarkable as it was for CHD. For all CVD, the chart was a cross between the charts for death risk due to CHD and to stroke. Again, the color gradient tended to proceed from the lower-left to the upper-right, although this gradient was weaker in all CVD than in CHD.

Discussion

Based on a 19-year follow-up study in a Japanese representative population, we constructed 10-year death probability charts for CHD, stroke, and all CVD, with a 6-color gradient showing 10-year probability of death. A major strength of these charts is that the risk of death was estimated using traditional risk factors based on a cohort study of a representative Japanese population. Our original charts created in this study may be more suitable in terms of generalization for Japanese people than others based on the modified Framingham CHD risk core, or a local cohort study[4,11–13,22] although these charts also contained a high-density lipoprotein cholesterol variable.

The risk assessment charts presented here show 10-year death probabilities, but not incidence probability. Therefore, the absolute death rate in these charts is lower than that of incidence. However, using a 6-color gradient from the highest (red) to the lowest (light blue) probability of death allows individuals to see their own position on the chart

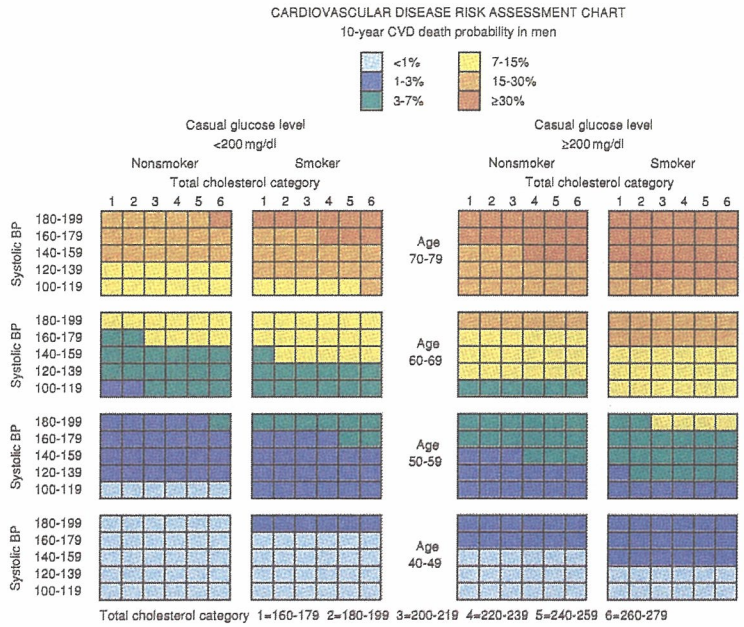

Fig 5. Risk assessment chart for 10-year probability of death due to all cardiovascular disease in men, NIPPON DATA80. Ten-year probability of death was calculated based on individual risk assessment using sex, age, systolic blood pressure (BP), serum total cholesterol, serum glucose and smoking habit. Someone with any of the cardiovascular disease (CVD) risk factors, despite belonging to the lowest risk group (light blue) should undergo risk factor modification by non-pharmacological and/or pharmacological treatment.

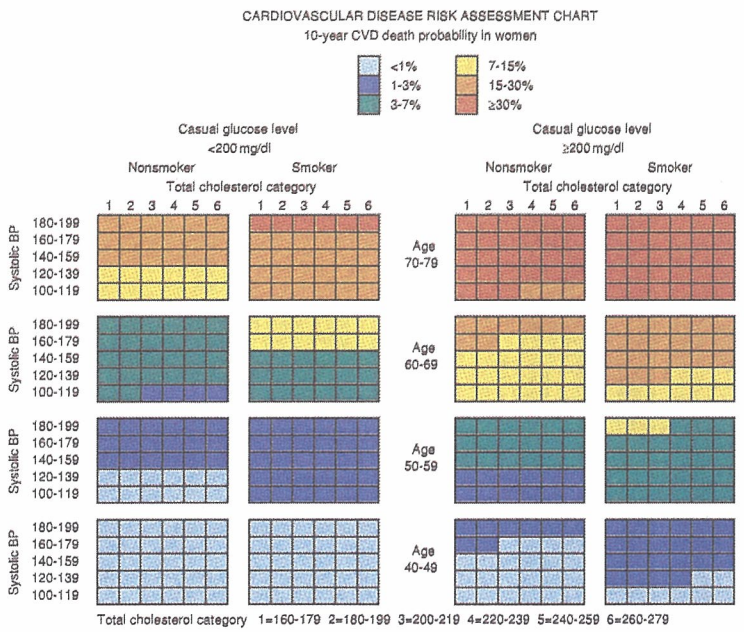

Fig 6. Risk assessment chart for 10-year probability of death due to all cardiovascular disease in women, NIPPON DATA80. Ten-year probability of death was calculated based on individual risk assessment using sex, age, systolic blood pressure (BP), serum total cholesterol, serum glucose and smoking habit. Someone with any of the cardiovascular disease (CVD) risk factors, despite belonging to the lowest risk group (light blue) should undergo risk factor modification by non-pharmacological and/or pharmacological treatment.

and easily understand their own risk level.

We estimated risk using an age range of 40–79 years and found that men and women in their 40s and 50s had a lower probability of death even if they had traditional risk factors (ie, smoking and hypertension). In contrast, men and women in their 70s had the highest probability of death (yellow, orange and red colors). If we had performed separate risk analysis on each 10-year age range, we could have identified the risk within any given 10-year age range. However, in this study, we followed a similar method of risk assessment as the Framingham CHD risk assessment score[4] and others![2] It should be understood that the charts presented here do not alleviate the need to control risk factors in younger individuals, despite their lower probability of death. For example, hypertension should be controlled in everyone by lifestyle modification, and by drug treatment, if necessary. If we ignore hypertension in younger individuals because of their lower risk of mortality from CHD and stroke, such individuals will have increased risk of mortality as they age. This principle also applies to modification of all traditional risk factors, such as high serum cholesterol, smoking, and DM.

Many epidemiologic studies in Japan, including NIPPON DATA80 and 90, have revealed risk factors for stroke, CHD, all heart disease, and all CVD![1–3,14,18,20–32] These risks for a specific disease are shown as either relative or absolute. Although absolute and relative risks are useful for health education, the risk assessment charts developed in this study should provide an improved health-education tool. A health professional can give more effective health

education to individuals using the charts rather than simply informing them of their relative or absolute risk of dying from a particular disease.

The CHD risk assessment chart resulting from this study was clearly graded but the stroke chart was not, mainly because serum total cholesterol was not a risk factor for stroke death, which has has been well documented in several cohort studies[2,26,29,33–35] As an epidemiological finding, stroke incidence and mortality in the general Japanese population varied directly with blood pressure but inversely with total serum cholesterol levels[2,6–8,10,14,20,21,24,28,29,33–35]

In conclusion, our risk assessment charts by sex for CHD, stroke, and all CVD can be used as a health-education tool to show risk of death in Japanese individuals. We hope that these charts are used not only in the clinic but also in the community and industrial health sectors.

Acknowledgments

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Appendix 1

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NIPPON DATA80: National Integrated Project for Prospective Observation of Non-Communicable Disease And its Trends in the Aged

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最大、最小血圧の循環器疾患死亡に及ぼす影響の年齢階級別分析(NIPPON DATA80)

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１．研究目的と方法

血圧が脳卒中をはじめとする循環器疾患の重要な危険因子であることは広く知られているが、最大最小血圧と循環器疾患死亡との関連について我が国ではほとんど検討されていない。我々は1980年の循環器疾患基礎調査受診者を対象としたコホート研究（NIPPON DATA 80）のデータセットを用いて、最大・最小血圧の健康影響を年齢階級別別に循環器疾患死亡に及ぼす影響の強さについて検討した。

本研究は遡りコホート研究の手法を用いて1994年に追跡調査を実施し、対象者の92%の生命予後と死因を明らかにして解析したものである。分析の対象者は男性での観察人年は64598人年で、観察期間中の循環器死亡者数は253名であった。降圧剤を服用したものは分析から除外した。最大血圧区分はI群 ＜120 mmHg, II群 120-139 mmHg, III群 140-159 mmHg, IV群 160-179 mmHg, および V群 180 mmHg以上とした。 最小血圧区分はI群 ＜80 mmHg, II群 80-84 mmHg, III群 85-99 mmHg, IV群 90-99 mmHg, および V群 100 mmHg以上とした。

2. 結果

最大最小血圧の区分別に循環器疾患死亡の年齢を調整した相対危険度を検討したところ、30－64歳および65－74歳の年齢階級ではどちらも有意に関連していた。しかし75歳以上では最大血圧では有意な関連がみられたが最小血圧では明らかな関連は認められなかった。Coxの比例ハザードモデルを用いて主要な危険因子を調整して最大最小血圧の一標準偏差あたりのハザード比を年齢階級別に比較したところ、75歳未満の年齢層では最大・最小血圧ともにほぼ同じ値を示したが、75歳以上では最大血圧が有意に関連していたのに対して、最小血圧ではほとんど関連がみられなかった。

3. 考察とまとめ

高齢者では動脈の硬化に伴い最大血圧は年齢とともに上昇するが、むしろ最小血圧は低くなることが知られている。従って高齢者では高血圧の判定や管理を若年のそれとは異なる手法を用いて行う必要があると考えられる。最近の研究から欧米では最大血圧の方が最小血圧よりよい指標であることが報告されている。しかし脳卒中の発症や死亡が心疾患より多い我が国の場合には欧米と異なる可能性は否定できない。本研究の結果我が国でも75歳未満では最大血圧と最小血圧の寄与はほぼ同じと考えられるが、75歳以上の高齢者では最大血圧の方が有用であることが示された。

血圧の脳卒中などに及ぼす健康影響(NIPPON DATA80)

NIPPON DATA80 Research Group ： J.Human Hypertens. 17:851-857,2003

１．研究目的と方法

血圧が脳卒中をはじめとする循環器疾患の重要な危険因子であることは広く知られているが、第６次改訂の高血圧区分と循環器疾患死亡や総死亡との関連に関する研究は我が国ではほとんど行われていない。我々は1980年の循環器疾患基礎調査受診者を対象としたコホート研究（NIPPON DATA80）のデータセットを用いて、血圧の健康影響を高血圧区分別に高血圧の循環器疾患や総死亡に及ぼす影響の強さについて検討した。

本研究は遡りコホート研究の手法を用いて1994年に追跡調査を実施し、対象者の92%の生命予後と死因を明らかにして解析したものである。対象者の観察人年は男性で53948人年、女性で70932人年で、観察期間中の死亡者数は1327名であった。対象者を高血圧区分に区分する際、降圧剤を服用していないものは血圧成績をそのまま用いて分類した。降圧剤服用中のものは検診受診時の最大最小血圧が140/90未満の場合には軽症高血圧区分としてあつかい、それ以上の血圧値を持つ服用者はそれぞれの高血圧区分に含めて解析を行った。

２．結果

表に高血圧区分別の脳卒中、心疾患、循環器疾患、総死亡の年齢を調整した相対危険度を示した。男性では高血圧区分が高くなるほど、脳卒中、心疾患、循環器疾患および総死亡の相対危険度が有意に高くなった。女性でも心疾患死亡をのぞいて有意に相対危険度が高くなった。以上から、血圧が高いことは脳卒中や心疾患などの循環器疾患の危険因子であることが確認されたとともに、総死亡にも強く影響する因子であることが明らかとなった。表には示さないが、関連が有意となった疾患への高血圧の影響はcoxの比例ハザードモデルを用いた重回帰分析（肥満度、飲酒習慣、喫煙、総コレステロール値、随時血糖値を調整）の結果でも有意であったことから、多の危険因子とは独立して寄与していると考えられる。

Coxの比例ハザードモデルによる他の循環器疾患危険因子を調整した高血圧区分の回帰係数を用いて、最適血圧を基準とし高血圧区分別の脳卒中の相対危険度を求め、当該区分の有病率から脳卒中による過剰死亡割合を求めた。過剰死亡割合とはその高血圧区分に属することによる脳卒中死亡の最適血圧に比較した増加割合を計算によって求めたものである。最適血圧区分でないことによる脳卒中の過剰死亡割合は男性で130%、女性で42%であり男性の方が多く観察された。この理由として男性の血圧が女性より高いことを反映していると考えられた。

高血圧区分がもっとも高い群で脳卒中の多因子調整相対危険度はもっとも高くなったが、対象者にしめる割合（有病率）が少ないために、過剰死亡割合は男性で22%、女性で7%に

とどまった。逆に軽症高血圧区分では脳卒中死亡の相対危険度は比較的小さくなるが、有病率が各区分でもっとも高くために、過剰死亡率も男性では48%、女性でも18%ともっとも高い値を示した。

3. 考察と結論

我が国では1970年以降、高血圧治療の普及や生活環境条件などの改善により脳卒中の年齢調整死亡率は著しい改善を認め、先進国の中でもほぼ中程度の死亡率にまで改善している。今後我が国が更に脳卒中死亡率の改善を図るには、脳卒中死亡の危険度の高い患者に対する適切な治療を行うとともに、軽症高血圧や、正常高値血圧に対して積極的な対策が必要と考えられる。

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1980年、1990年、2000年の循環器基礎調査に基づいた、日本人心房細動患者数の推計

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背景： 心房細動は死亡リスクを高めるばかりではなく、心不全や脳卒中発症リスクを高めることにより、医療費や介護などの社会経済的な負担を増大させていることが欧米では示されている。高齢化が進む社会では心房細動患者が今後さらに増加することが予想される。しかし、世界で最も急速に高齢化が進行している日本では心房細動の疫学研究は殆どみられず、日本人心房細動有病率も十分に明らかにされていない。

目的： 日本人一般住民を対象として、過去20年間の心房細動の有病率を明らかにして心房細動患者数の推移を検討するとともに今後の心房細動患者数を予測すること。

対象と方法： 対象は、全国300地区の30歳以上の者を対象として行われた、過去3回の循環器疾患基礎調査(1980年、1990年、2000年)参加者で、基礎調査で心電図記録が行われた23,713人。循環器基礎調査では、全国から300地点を無作為抽出し、性別・年代構成を日本人の人口構成に一致させて対象者を選択している。安静時心電図記録は調査時に1回行われ、心電図判読はミネソタコードに従ってコーディングされ、ミネソタコードの8－3にコードされた場合を心房細動あり、と定義した。10歳階級ごとに心房細動有所見率を男女別に明らかにし、1980年、1990年、2000年の各調査で年齢階級別に心房細動有所見率を男女別にχ二乗検定で比較した。人口動態統計を用いて過去20年間の日本人成人心房細動患者数を推計し、人口問題研究所の提供する2010年から2030年までの人口推計（中位推計）を参考として、将来の心房細動患者数を推計した。

結果: 過去20年間の性・年齢階級別心房細動有病率に差はみられなかった。30歳以上の男性の心房細動有所見率は1.0%で女性の有所見率は0.6%であり、男性の有所見率が高かった。10歳階級別の心房細動有所見率を男女で比較すると、30代から60代で性差はみられず、70代以降で男性の心房細動有所見率が高かった。過去3回の調査全体の性年齢階級別心房細動有病率を人口動態統計に当てはめて心房細動患者数を推計すると、1980年は日本全体で39.1万人、1990年53.4万人、2000年72.9万人存在していたことになる。尚、将来の日本人人口推計に当てはめて心房細動患者数を推計すると、2010年は日本全体で99.5万人、2020年は105.5万人、2030年は108.1万人の心房細動患者が存在することが示唆された。

結語: 日本人一般住民を対象とした1980年から2000年までの過去20年間の調査結果によると、性年齢階級別の心房細動の有病率には変化は見られなかった。しかし、人口の高齢化により20年間で心房細動患者数はおよそ2倍となり、今後更に人口の高齢化が進むことで、心房細動患者が急激に増加することが予測された。

血清クレアチニン値が全死亡、全循環器疾患死亡および全がん死亡に及ぼす影響
－日本人の代表的集団 NIPPON DATA80 の 19 年間の追跡結果より－

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【目的】

健康診断で測定される血清中クレアチニンは、加齢および体格によって影響を受けるが、総死亡に及ぼす影響はまだ十分には明らかにはされていない。本報では日本人の代表的集団 NIPPON DATA80 の 19 年間の追跡結果を用いて、血清クレアチニンと総死亡の関連について検討した。

【対象と方法】

1980 年、全国から無作為抽出された 300 調査区の満 30 歳以上の全住民を対象とする循環器疾患基礎調査受診者を 19 年間追跡した（ NIPPON DATA80 ）。このうち血圧、BMI (Body Mass Index)、血清クレアチニンおよび尿蛋白が測定された 9,459 名（男 4,159 名、観察 70,086 人年，女 5,300 名、観察 92,740 人年）を解析対象とした。男女それぞれ、開始時調査時の血清クレアチニン値階級別（男：-0.9，1.0，1.1，1.2mg/dl-，女：-0.7，0.8，0.9，1.0mg/dl-）に４等分し、開始時調査の各項目の年齢調整平均値を連続変量は分散分析、度数データは直接法により求めた。直線性の検定では線形トレンド検定と拡張 Mantel 検定を行った。また、19 年間の追跡結果から全死亡、全循環器疾患死亡および全がん死亡について性別各階級別に年齢調整死亡率を求めた。さらに、男女別にもっとも年齢調整死亡率が低い階級（男：1.1mg/dl，女 0.8mg/dl）を基準として他階級の年齢階級別相対危険度を求め、Mantel-Haenszel 法により年齢調整相対危険度および 95% 信頼区間を求めた。血清クレアチニン値が年齢、体格および他の因子を調整した死亡に及ぼす影響については Cox の比例ハザードモデルを用いて性別にもっとも年齢調整死亡率が低い階級に対する他階級のハザード比および 95%信頼区間を算出した。

【結果】

開始時調査における血清クレアチニン値階級別にみた各項目の値を表１に、年齢調整した値を表２に示した。男では第２四分位（1.0mg/dl）でもっとも平均年齢が低く、年齢調整値においても、最高血圧、血清総蛋白、高血圧治療あり、蛋白尿あり、喫煙、飲酒習慣で同様の傾向を示した。女ではクレアチニン値がもっとも低い階級（0.7mg/dl 以下）で平均年齢が低く、年齢調整値で男と同様に第２四分位（0.8mg/dl）でもっとも低くなった項目は BMI、高血圧治療あり、蛋白尿あり、喫煙習慣であった。

クレアチニン値階級と年齢調整死亡率との関連を表３に示した。全死亡の年齢調整死亡率は男で第３四分位（1.1mg/dl）で 8.7（対 1,000 人年）ともっとも低く、両端の階級で高かった。また、全循環器疾患死亡、全がん死亡とも総死亡と同様の傾向を示した。女の総死亡では第２四分位（0.8mg/dl）で 4.6 ともっとも低く、やはり両端の階級で高かった。また、全循環器疾患、全がん死亡とも第２四分位の階級でもっとも低かった。