Table 3 Sex-specific multivariable-adjusted HRs of death from all causes, cancer, CVD and other causes among subgroups of people with and without illnesses; and smokers and non-smokers

	Men						Women					
	Loss ≥5 kg		Stable, change <5 kg		Gain ≥5 kg		Loss ≥5 kg		Stable, change <5 kg		Gain ≥5 kg	
Cause of death	Deaths	HR* (95% CI)	Deaths	HR	Deaths	HR* (95% CI)	Deaths	HR* (95% CI)	Deaths	HR	Deaths	HR* (95% CI)
Without illnesses†												
All causes	468	1.46 (1.29 to 1.64)	804	1.0	856	0.96 (0.86 to 1.08)	196	1.22 (1.02 to 1.47)	335	1.0	592	0.99 (0.85 to 1.16)
Cancer	206	1.34 (1.13 to 1.62)	361	1.0	401	1.00 (0.84 to 1.18)	85	1.01 (0.77 to 1.33)	177	1.0	320	1.00 (0.81 to 1.24)
CVD	58	1.18 (0.84 to 1.65)	118	1.0	107	0.72 (0.53 to 0.99)	22	1.20 (0.71 to 2.04)	43	1.0	83	0.91 (0.60 to 1.38)
Other causes	204	1.70 (1.41 to 2.05)	325	1.0	348	1.02 (0.85 to 1.22)	89	1.51 (1.13 to 2.02)	115	1.0	189	1.04 (0.80 to 1.36)
With illnesses†												
All causes	680	1.44 (1.29 to 1.61)	726	1.0	891	0.83 (0.74 to 0.94)	222	1.50 (1.24 to 1.82)	228	1.0	496	0.97 (0.81 to 1.16)
Cancer	265	1.20 (1.01 to 1.43)	317	1.0	368	0.82 (0.69 to 0.97)	77	1.46 (1.06 to 2.00)	85	1.0	226	1.10 (0.83 to 1.45)
CVD	111	1.52 (1.15 to 2.00)	115	1.0	174	0.93 (0.71 to 1.21)	41	1.21 (0.78 to 1.88)	49	1.0	90	0.81 (0.54 to 1.21)
Other causes	304	1.69 (1.43 to 2.00)	294	1.0	349	0.83 (0.69 to 0.99)	104	1.69 (1.26 to 2.26)	94	1.0	180	0.94 (0.70 to 1.25)
Non-smokers												
All causes	347	1.46 (1.27 to 1.69)	529	1.0	815	0.95 (0.84 to 1.08)	356	1.36 (1.18 to 1.57)	493	1.0	975	0.99 (0.87 to 1.12)
Cancer	128	1.31 (1.05 to 1.65)	224	1.0	371	1.00 (0.82 to 1.21)	141	1.20 (0.97 to 1.49)	233	1.0	503	1.06 (0.89 to 1.26)
CVD	50	1.37 (0.94 to 1.98)	79	1.0	133	0.86 (0.62 to 1.19)	46	1.14 (0.77 to 1.67)	76	1.0	148	0.86 (0.62 to 1.18)
Other causes	169	1.64 (1.32 to 2.03)	226	1.0	311	0.95 (0.77 to 1.16)	169	1.61 (1.29 to 2.01)	184	1.0	324	0.95 (0.78 to 1.17)
Smokers												
All causes	790	1.43 (1.29 to 1.58)	993	1.0	926	0.86 (0.77 to 0.95)	57	1.15 (0.79 to 1.66)	68	1.0	108	0.88 (0.61 to 1.25)
Cancer	337	1.24 (1.07 to 1.44)	452	1.0	395	0.84 (0.72 to 0.98)	19	0.99 (0.54 to 1.81)	27	1.0	40	0.92 (0.51 to 1.65)
CVD	118	1.34 (1.03 to 1.73)	150	1.0	146	0.78 (0.60 to 1.02)	15	1.41(0.68 to 2.90)	16	1.0	24	0.59 (0.28 to 1.23)
Other causes	335	1.71 (1.46 to 1.99)	391	1.0	385	0.91 (0.77 to 1.07)	23	1.15 (0.62 to 2.12)	25	1.0	44	1.10 (0.62 to 1.95)

*HR was adjusted for age; current body mass index; smoking status (non-smoker, <20 cigarettes/day and ≥20 cigarettes/day); alcohol intake (non-drinker, 1–23 g/day, 23–46 g/day, 46–69 g/day and ≥69 g/day); sports and physical exercise; medications or past history of hypertension and diabetes; and past history of liver disease and kidney disease stratified by JPHC communities and age groups of 40–49 years, 50–59 years and 60–69 years.
†Includes any of hypertension, diabetes, liver disease, kidney disease, asthma, allergy, stomach ulcer and gallstone.
CVD, cardiovascular disease.

Table 4 Sex-specific multivariable-adjusted* HRs for deaths from all causes, cancer, CVD and other causes, according to weight change category since age 20 stratified by baseline BMI

			Baseline BMI, <18.5 kg/m²			Baseline BMI, 18.5–24.9 kg/m²			Baseline BMI, ≥25 kg/m²		
			Weight change since age 20			Weight change since age 20			Weight change since age 20		
Sex	Cause of death		Loss ≥5 kg	Stable, change <5 kg	Gain ≥5 kg	Loss ≥5 kg	Stable, change <5 kg	Gain ≥5 kg	Loss ≥5 kg	Stable, change <5 kg	Gain ≥5 kg
Men	All causes	Deaths	178	67	6	883	1352	920	77	100	811
		HR* (95% CI)	2.40 (2.04 to 2.82)	1.30 (1.01 to 1.68)	1.59 (0.71 to 3.56)	1.35 (1.23 to 1.47)	1.00	0.83 (0.76 to 0.90)	1.36 (1.08 to 1.72)	0.76 (0.62 to 0.94)	0.80 (0.73 to 0.88)
	Cancer	Deaths	67	25	3	374	597	410	24	48	354
		HR* (95% CI)	1.84 (1.41 to 2.39)	1.14 (0.76 to 1.70)	1.75 (0.56 to 5.45)	1.23 (1.08 to 1.41)	1.00	0.86 (0.76 to 0.98)	0.96 (0.63 to 1.44)	0.83 (0.61 to 1.13)	0.84 (0.74 to 0.97)
	CVD	Deaths	13	11	1	145	211	139	10	11	139
		HR* (95% CI)	1.18 (0.67 to 2.08)	1.32 (0.70 to 2.49)	–†	1.34 (1.07 to 1.68)	1.00	0.75 (0.60 to 0.94)	0.96 (0.51 to 1.83)	0.47 (0.25 to 0.89)	0.78 (0.62 to 0.98)
	Other causes	Deaths	98	31	2	364	544	371	43	41	318
		HR* (95% CI)	3.60 (2.88 to 4.50)	1.47 (1.01 to 2.14)	–†	1.49 (1.29 to 1.71)	1.00	0.83 (0.72 to 0.95)	1.96 (1.43 to 2.68)	0.81 (0.58 to 1.12)	0.77 (0.67 to 0.89)
Women	All causes	Deaths	79	52	9	307	462	517	26	46	554
		HR* (95% CI)	2.12 (1.66 to 2.70)	1.61 (1.21 to 2.16)	2.46 (1.22 to 4.95)	1.26 (1.08 to 1.46)	1.00	0.91 (0.80 to 1.04)	1.29 (0.86 to 1.94)	0.84 (0.62 to 1.14)	1.04 (0.91 to 1.18)
	Cancer	Deaths	29	20	6	117	220	271	13	20	265
		HR* (95% CI)	1.71 (1.15 to 2.55)	1.31 (0.83 to 2.07)	3.15 (1.30 to 7.66)	1.06 (0.84 to 1.33)	1.00	1.00 (0.83 to 1.20)	1.56 (0.89 to 2.75)	0.82 (0.52 to 1.31)	1.11 (0.92 to 1.34)
	CVD	Deaths	7	6	1	50	78	74	6	8	98
		HR* (95% CI)	1.07 (0.49 to 2.34)	0.98 (0.40 to 2.44)	–†	1.16 (0.80 to 1.68)	1.00	0.77 (0.55 to 1.07)	1.36 (0.55 to 3.39)	0.82 (0.39 to 1.71)	1.02 (0.74 to 1.39)
	Other causes	Deaths	43	26	2	140	164	172	7	18	191
		HR* (95% CI)	3.16 (2.24 to 4.46)	2.34 (1.54 to 3.54)	–†	1.56 (1.24 to 1.97)	1.00	0.86 (0.69 to 1.07)	0.96 (0.45 to 2.06)	0.87 (0.53 to 1.42)	0.95 (0.75 to 1.19)

*HR was adjusted for age; current body mass index; smoking status (non-smoker, <20 cigarettes/day and ≥20 cigarettes/day); alcohol intake (non-drinker, 1–23 g/day, 23–46 g/day, 46–69 g/day and ≥69 g/day); sports and physical exercise; medications or past history of hypertension and diabetes; and past history of liver disease and kidney disease stratified by JPHC communities and age groups of 40–49 years, 50–59 years and 60–69 years.
†Not represented because of fewer cases.
BMI, body mass index, CVD, cardiovascular disease.

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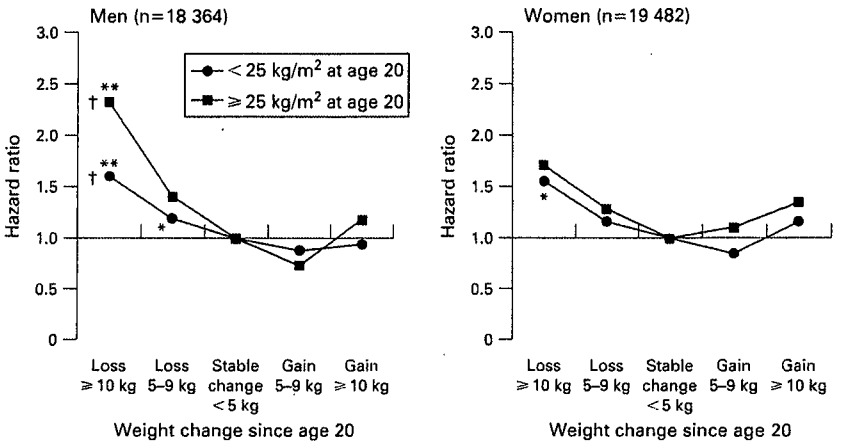

Figure 2 Multivariable-adjusted HRs of all-cause mortality according to weight change category by body mass index (BMI) at age 20 in cohort II. Covariate variables were the same as in table 2. *p<0.05; **p<0.001 for difference versus stable change group. †p<0.001 for linear trends.

and overweight men, an inverse linear association between weight gain and mortality was found (p for trend <0.001).

DISCUSSION

This large prospective cohort study confirmed a strong association between weight loss after early adulthood and all-cause mortality, death from cancer (men only), CVD (men only) and other causes. These findings applied to middle-aged Japanese men and women, regardless of whether they had illnesses, were smokers or were overweight. The HR for all-cause mortality increased with weight loss in each age group and for other causes of death, and was higher in the younger bracket for men and women with weight loss. Further, when subjects were stratified by BMI at baseline or age 20, the association between weight loss and death was the same. On the contrary, weight gain seemed to be protective against mortality in men. These findings remained unchanged after exclusion of the first 5 years of follow-up, which was done to avoid a potential effect of latent diseases. The previous JPHC study reported that both overweight and underweight subjects at baseline had an increased risk of death, representing a U-shaped association. Furthermore, mortality was higher for individuals who were underweight rather than overweight when considered with weight change.[12]

Of interest, weight gain did not predict CVD mortality in the JPHC cohort. Compared with Caucasians, mean BMI is very low in Japanese individuals, leading to a low level of high-sensitivity C-reactive protein,[17] a low grade of atherosclerosis,[18] and one-quarter the mortality from coronary heart disease.[19] Recently, data from this cohort documented that men with high BMIs or with weight gain ≥10 kg who were relatively lean (<21.7 kg/m²) at age 20 were at risk for coronary heart disease,[20] although there were no linear trends between weight gain and risk. Given these previous findings and the significant association between weight loss and death as seen in the present study, it may be hypothesised that obesity-induced atherosclerosis may be rather uncommon in Japan. Instead, we believe that hypertension is an essential factor for atherosclerosis more than other traditional risk factors, as pathological studies have documented.[21 22] These data support our results and suggest two different pathogenic mechanisms of atherosclerosis in Japanese and Caucasians.

The underlying mechanism responsible for the association between weight loss and the risk of death is not fully understood. In general, weight loss is considered to be caused by several physical conditions, such as nutrient deficiency related to liver disease, heavy alcohol drinking, smoking and worsening diabetes. Therefore, even though we adjusted for these confounders in the analysis of multivariable models, the associations still remained. Also, a British study emphasised the effect of smoking on weight change and mortality.[25] In the present study, when subjects were stratified by smoking conditions (current smokers or others), there was an increased risk of death for those with weight loss regardless of smoking habits and no interactions between smoking and weight loss with mortality. People who lost weight may have had underlying health problems or illnesses related to weight loss, although we evaluated several illnesses in this study.

The JPHC study has the advantage of providing large cohorts and assesses the effects of numerous variables on health practices. However, several limitations should be noted. First, we calculated BMIs according to self-reported weight and height values. When analysed in the subgroup in which health check-up data were available, measured BMI almost corresponded to self-reported BMI (r = 0.89 in men and 0.91 in women), as described elsewhere.[12] Second, weight at age 20 was not validated in our study, in spite of the high rank correlation coefficient for self-reported weight; however, a previous study in Japan validated the use of recalled weight for epidemiological studies.[24] Because men with higher BMI tended to underestimate their weights at age 25, a bias for weight change was expected to be large for those individuals. This potential classification bias may weaken the association between weight gain and risk of death among obese people. Third, covariates in our study might not be sufficient to explain the association between weight loss and mortality, because weight change, especially weight loss, is thought to be related to several conditions of illness or an unfavourable lifestyle. Furthermore, we did not exclude people with intentional weight loss in our analysis. Fourth, the specific cause of death was not validated in this study. Validation studies in Japan indicated that diagnoses of death from cancer and stroke were generally correct, but those of death from coronary heart disease were not.[25] Therefore, potential diagnostic bias on death certificates for coronary heart disease was real in the present study.

In conclusion, although there is no doubt that weight gain elevates the risks of atherosclerosis and CVD,[26] we found an inverse relationship in men and an L-shaped association in

What is already known on this subject

Weight change since early adulthood is widely known to be a risk factor for all-cause mortality in Caucasians. However, little is known about the association in the Asian population. Therefore, we examined the association between weight change and specific-cause mortality in a 12.9-year follow-up of a large prospective study in Japan.

What this study adds

This study confirmed that weight loss strongly predicted all-cause, cancer and CVD mortality, primarily for men in an Asian population with low BMI. An unfavourable effect of weight gain was weak at the population level.

women between weight change and all-cause mortality among middle-aged Japanese individuals, regardless of current or early adulthood BMI. In fact, people with a high BMI (≥30 kg/m^2) have shortened longevity in Japan; however, an unfavourable effect of weight gain on mortality was small at the population level.

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APPENDIX A

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横断・縦断研究
研究報告書

放射線影響研究所・成人健康調査における疫学研究

分担研究者　（財）放射線影響研究所臨床研究部　山田美智子

研究要旨
放射線影響研究所成人健康調査では1958年から固定集団を設定し、2年毎の健診による調査を継続してきた。2005－2007年に実施した健診の参加者で空腹時血液検査の条件を満たす約1000人についてメタボリックシンドロームと尿酸値ならびにホモシステイン値の関連を横断的研究手法により検討した。メタボリックシンドロームと高尿酸血症ならびにメタボリックシンドロームと高ホモシステイン血症に関連が認められ、高尿酸血症ならびに高ホモシステイン血症が動脈硬化性疾患のリスク因子であるという過去の論文報告を支持する結果であった。また今回の研究結果は高尿酸血症ならびに高ホモシステイン血症がメタボリックシンドロームを介して間接的に動脈硬化性疾患の増加に関与する可能性やメタボリックシンドローム構成項目以外の共通するリスク因子の存在を示唆した。動脈硬化性疾患におけるメタボリックシンドローム、高尿酸血症、高ホモシステイン血症の関与に関する機序を解明するために研究期間を延長した縦断的検討が必要である。

A:研究目的

メタボリックシンドロームではインスリン抵抗性が重要な役割を果たし心血管疾患のリスク因子が集簇していると考えられている。また高尿酸血症ならびに高ホモシステイン血症が動脈硬化性疾患の独立したリスク因子であるという報告や高尿酸血症ならびに高ホモシステイン血症にインスリン抵抗性が関与しているという報告がある。しかし、メタボリックシンドロームと高尿酸血症ならびに高ホモシステイン血症の関連をみた研究では一致した結果が得られていない。そこでメタボリックシンドロームと尿酸値ならびにホモシステイン値の関連を横断的研究手法により検討する。

B:研究対象と方法

2005－2007年の成人健康調査での健診参加者の内、血液検査を空腹時に受け、尿酸値、ホモシステイン値、メタボリックシンドロームの各構成因子の情報を有した979名（男性355名、女性624名）を対象とした。

測定項目には肥満度（BMI）、ウエスト周囲径、収縮期・拡張期血圧、血糖値、HbA1c、LDLコレステロール、HDLコレステロール、中性脂肪、クレアチニン、高感度CRP,ホモシステイン（酵素法）を含む。また、質問票調査により喫煙、飲酒の情報を得た。高尿酸血症は尿酸値>7.0mg/dlならびに高尿酸血症治療中、高ホモシステイン血症はホモシステイン>14μmol/lとした。メタボックシンドロームの定義は米国心臓協会（AHA）・米国国立心肺研究所（NHLBI）の診断基準を一部改変して用いた。（表1）

メタボリックシンドロームと高尿酸血症ならびにメタボリックシンドロームと高ホモシステイン血症の関係は性、年齢、その他の因子を調整した多変量調整モデルを用いたロジスティック回帰分析で解析した。

（倫理面での配慮）
成人健康調査は文部科学省・厚生労働省の「疫学研究に関する倫理指針」に準拠して行われており、放

射線影響研究所の倫理委員会である人権擁護調査委員会の承認を得ている。研究者は対象者の個人情報の漏洩を防ぐための細心の注意を払い、その管理に責任を負っている。

C: 研究結果

尿酸値ならにホモシステイン値の平均値は女性に比べ男性で高かった。(表2) 性・年齢別のメタボリックシンドローム、高尿酸血症、高ホモシステイン血症の頻度を図1-3に示す。女性ではいずれの頻度も年齢の増加と共に上昇した。男性では高ホモシステイン血症の頻度は年齢と共に増加したが、年齢80歳以上ではメタボリックシンドロームならびに高尿酸血症の頻度が80歳未満に比べ低かった。

多変量（年齢、性、喫煙、飲酒、CRP、ｸﾚｱﾁﾆﾝ、被爆線量）を調整し、尿酸値のメタボリックシンドローム有病への影響をみたロジスティック解析の結果、尿酸値の1mg/dl増加に伴うメタボリックシンドローム有病率のオッズ比は男性で1.34（P=0.005)、女性で1.35（P<0.001）で、有意な有病率の増加を認めた。(表3) また、CRP値の上昇と男性における現喫煙でメタボリックシンドローム有病率が有意に増加した。

高ホモシステイン血症の有病率のオッズ比はメタボリックシンドロームで1.65（P=0.02）と有意に増加した。また年齢増加、ｸﾚｱﾁﾆﾝ値増加、現喫煙でも有意に増加した。

D:考察

高尿酸血症ならびに高ホモシステイン血症と動脈硬化性疾患ならびにメタボリックシンドロームの関連を日本人対象者でみた研究は少なく、現在までに一致した結果は得られていない。今回の調査集団の母集団である成人健康調査集団約1万人を1966-1999年の平均25年間追跡し、ベースライン時の尿酸値と総死亡ならびに心血管死亡の関連を解析した過去の研究では女性では総死亡ならびに心血管死亡が尿酸値の増加と共に増加し、男性では総死亡が増加したことを報告している。今回の横断調査でメタボリックシンドロームと高尿酸血症に関連が認められ、高尿酸血症が動脈硬化性疾患のリスク因子であるという過去の論文報告に矛盾しない。また、メタボリックシンドロームと高ホモシステイン血症の関連も認められ、高尿酸血症ならびに高ホモシステイン血症にインスリン抵抗性が関与しているという報告を支持する結果であった。今回の横断調査の結果は高尿酸血症ならびに高ホモシステイン血症がメタボリックシンドロームを介して間接的に動脈硬化性疾患の増加に関与する可能性やメタボリックシンドローム構成項目以外の共通するリスク因子の存在を示唆したが、動脈硬化性疾患におけるメタボリックシンドローム、高尿酸血症、高ホモシステイン血症の関与に関する機序を解明するためには縦断研究による確認が必要である。

E: 結論

メタボリックシンドロームと高尿酸血症ならびにメタボリックシンドロームと高ホモシステイン血症に関連が認められ、高尿酸血症ならびに高ホモシステイン血症が動脈硬化性疾患のリスク因子であるという過去の論文報告を支持する結果であった。

動脈硬化性疾患におけるメタボリックシンドローム、高尿酸血症、高ホモシステイン血症の関与に関する機序を解明するために研究期間を延長した縦断検討が必要である。

F:研究危険情報

なし

G:研究発表

1. 論文発表

なし

2. 学会発表

1) 立川佳美、増成直美、大石和佳、山田美智子、他. メタボリックシンドロームと高ホモシステイン血症との関連. 第52回 日本糖尿病学会年次学術集会 大

阪　2009. 5

2）立川佳美、増成直美、山田美智子、他. メタボリックシンドロームと血清尿酸値との関連. 第9回 日本内分泌学会中国支部学術集会　広島　2009. 3

3）大石和佳、立川佳美、藤原佐枝子、山田美智子、他. メタボリックシンドロームにおける肝機能異常と脂肪肝の実態. 第13回 日本肝臓学会大会　京都　2009. 10

4）立川佳美、増成直美、山田美智子、他. 血清尿酸値とメタボリックシンドローム有病率：広島成人健康調査. 第14回 国際内分泌学会　京都　2010. 3

H:知的財産権の出願・登録状況

なし

I:　研究協力者

立川佳美　（放射線影響研究所臨床研究部）

表1.メタボリックシンドロームの定義

◆ 米国心臓協会(AHA)/米国国立心肺研究所(NHLBI)の診断基準
(一部改変)

下記5項目のうちから3項目以上

1）中心性肥満(アジア人向けの基準)
ウエスト周囲径　男性＞90cm、女性＞80cm

2）糖代謝異常
空腹時血糖値　≥100mg/dl or　糖尿病治療中

3）低HDLコレステロール(HDL-C)血症
男性　HDL-C<40 mg/dl、女性　HDL-C＜50 mg/dl

4）高中性脂肪血症
中性脂肪≥150mg/dl

5）血圧高値
血圧≥130/85 mm Hg or 高血圧治療中

表2. 対象者の特徴

	全体 (979名)	男性 (356名)	女性 (624名)
年齢(歳)*	71.5 (7.7)	69.8 (7.5)	72.5 (7.7)
BMI (kg/m^2)*	23.0 (3.4)	22.9 (2.9)	23.0 (3.6)
ウエスト周囲径 (cm)*	84.9 (9.3)	85.0 (8.0)	84.7(10.0)
血糖値(mg/dl)*	100.4 (16.4)	103.6 (16.3)	98.6 (16.2)
HbA1C (%)*	5.5 (0.6)	5.6 (0.7)	5.5(0.6)
収縮期血圧 (mmHg)*	132.2 (18.6)	132.5 (17.5)	132.0 (19.2)
拡張期血圧 (mmHg)*	77.3 (10.3)	78.6 (9.9)	76.5 (10.4)
LDLコレステロール (mg/dl)*	121.8 (32.3)	116.5 (31.0)	124.8 (32.6)
HDLコレステロール (mg/dl)*	60.7 (16.2)	56.7 (15.7)	62.9 (16.1)
中性脂肪 (mg/dl)	117.7 (80.7)	132.5 (102.5)	109.3 (63.7)
クレアチニン (mg/dl)*	0.72 (0.37)	0.85 (0.23)	0.64 (0.41)
尿酸値 (mg/dl)	5.2(1.3)	5.9 (1.3)	4.8 (1.2)
ホモシステイン (μmol/l)*	10.6 (6.1)	11.3 (6.3)	10.3 (6.0)
CRP (mg/dl)*	0.19 (0.50)	0.23 (0.64)	0.17 (0.40)
高血圧(%)	57.2	59.2	56.1
糖尿病(%)	9.9	13.8	7.7
現喫煙 (%)	13.5	27.3	5.6
現飲酒 (%)	45.1	72.4	29.6

*平均値 (± 標準偏差(SD))

図1. 年齢及び男女別メタボリックシンドロームの頻度
(AHA-NHLBI criteria)

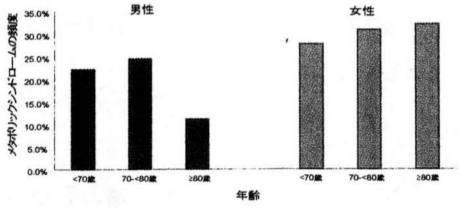

図2. 年齢及び男女別高尿酸血症の頻度
(上段は治療中)

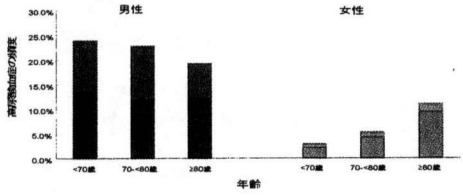

図3. 年齢及び男女別高ホモシステイン血症の頻度

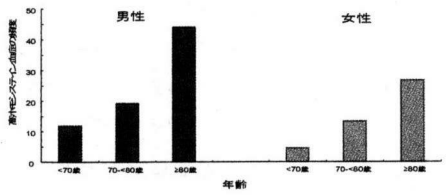

表3. メタボリックシンドロームの有病率に影響を与える因子
(多変量で調整)

	オッズ比	
	男性	女性
尿酸(1mg/dl増加)	**1.34 (1.10-1.64)**	**1. 35 (1.14-1.60)**
年齢(10歳増加)	1.00 (0.71-1.41)	1.16 (0.91-1.49)
現喫煙(vs非喫煙+既喫煙)	**1.73 (1.01-2.99)**	1.27 (0.59-2.75)
現飲酒(vs非飲酒+既飲酒)	1.22 (0.69-2.16)	0.74 (0.49-1.11)
CRP(1mg/dl増加)	**1.37 (1.13-1.67)**	**1.31 (1.14-1.52)**
クレアチニン(1mg/dl増加)	1.18 (0.38-3.69)	0.97 (0.46-2.03)

表4. 高ホモシステイン血症に影響を与える因子
(多変量で調整)

変数	オッズ比	*P*
年齢(1歳あたり)	**1.07 (1.04-1.11)**	**<0.001**
男性 (vs. 女性)	1.48 (0.88-2.49)	0.14
現喫煙	**3.13 (1.78-5.49)**	**<0.001**
クレアチニン(対数変換)	**16.6 (6.64-41.6)**	**<0.001**
メタボリックシンドローム	**1.65 (1.10-2.50)**	**0.02**
CRP (対数変換)	1.08 (0.92-1.27)	0.34
放射線量	1.00 (1.00-1.00)	0.98