Risk Assessment Chart for Predicting Fatty Liver in Japanese Subjects

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Objective: The diagnosis of fatty liver is done mainly by ultrasonography, which it is not included in the usual health checkup examinations. The aim of this study was to develop an index to predict the existence of fatty liver using tests that are part of specific health examinations.
Methods: A total of 7,305 Japanese (4,042 men; 3,263 women) who underwent annual health checks were enrolled. Body mass index (BMI), Waist circumference (WC), blood pressure, and levels of triglyceride (TG), high-density lipoprotein cholesterol, fasting plasma glucose (FPG), alanine aminotransferase (ALT), and gamma-glutamyl transpeptidase were used to predict fatty liver, and a stepwise procedure was used to select an optimal subset of dummy regressors. The probabilities for predicting fatty liver were calculated from the logistic regression equation using the constant and coefficients for each variable.
Results: Risk assessment charts for predicting the probability of fatty liver were developed. These probabilities were displayed in a color-coded manner by combining BMI, TG, FPG, ALT, and WC.
Conclusion: Our fatty liver-predicting index consisted of the components of metabolic syndrome (MetS) and ALT, thus indicating a close relationship of fatty liver and MetS. The use of this index enables quantitative assessments of the severity of MetS.

Key words: fatty liver, health examination, metabolic syndrome

INTRODUCTION

The incidence of obesity has increased in recent years. Obesity and associated disorders, such as fatty liver disease and metabolic syndrome (MetS), contribute to serious health problems.

MetS, which is a risk factor for the development of type 2 diabetes mellitus and coronary artery disease, is associated with an increased risk of cerebrovascular disease and all-cause mortality [1]. The prevalence of MetS is increasing throughout the world [2]. About 40% of adults in the US population are estimated to have MetS [3]. Among 268,062 Japanese subjects (165,726 men; 102,336 women), 27,027 men (16.3%) and 2,696 women (2.6%) were diagnosed with metabolic syndrome [4].

Fatty liver, which is closely associated with MetS, is considered the hepatic manifestation of MetS [5, 6]. The majority of fatty liver disease is comprised of alcoholic fatty liver and nonalcoholic fatty liver disease (NAFLD). NAFLD is becoming more common in Japanese subjects. NAFLD consists of a wide spectrum of conditions, ranging from simple steatosis to nonalcoholic steatohepatitis, which can progress to cirrhosis and hepatocellular carcinoma.

In Japan, basic health examinations were conducted in April 2008 with specific health examination and guidance, which were aimed for those who were aged 40 to 74 and who were covered by health insurance. This examination and guidance included advice to prevent MetS and detect lifestyle-related diseases at an early stage. The diagnosis of fatty liver was done mainly by ultrasonography, which is not included in the usual health examination program. Thus, we cannot make a diagnosis of fatty liver in routine health examinations. The aim of this study was to develop an index to predict the existence of fatty liver using tests of specific health examination.

SUBJECTS AND METHODS

Study design

We performed a cross-sectional study of participants of a health examination program, the so-called "Ningen dock", which included abdominal ultrasonography. The purpose of the health examination program was to promote public health through the early detection of chronic diseases and to evaluate their underlying risk factors.

The health examinations are generally classified into 2 styles in Japan. The first is the legal health check-up program, which is established by the law. The other is the Ningen dock, which is for people who wish to participate through their own will. For example, the specific health examination, which is one of the legal health checkup programs, is aimed for all who are aged 40–74 and who are covered by health insurance. The examination includes anthropometric measurements, blood pressure measurements, blood biochemistry examinations (glucose, lipid, and liver function) and urinalysis. The debriefing reports are often sent by post afterward. However, the Ningen dock is an optional examination for people who wish to evaluate and promote their health (mainly to rule out the existence of cancer and/or arteriosclerotic disease). Each

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Ningen dock center has different examinations, and these generally include many items, such as abdominal ultrasonography and upper gastrointestinal examinations. The explanation of the examination results and health guidance are often done on the consultation day.

Study population

A total of 7,305 people (4,042 men; 3,263 women) who first underwent annual health examinations at Tokai University Hachioji Hospital between April 2007 and March 2011 were enrolled in this study. Verbal consent was obtained from the subjects for the use of their health records for the analysis. The present study was approved by the Ethics Committee of Tokai University School of Medicine, and it complied with the Helsinki Declaration.

Data collection

The health examination program (Ningen dock) that was used for the collection of data included the following tests: eye examinations, urinalysis, blood-cell counts, blood chemistry, electrocardiography, chest radiography, barium examinations or endoscopy of the upper gastrointestinal tract, and abdominal ultrasonography. The medical history and lifestyle factors of all participants, including their levels of physical activity and habits pertaining to smoking and alcohol consumption, were surveyed by a standardized self-administered questionnaire. When the participants had difficulty completing the questionnaire, trained nurses provided assistance.

Anthropometric measurements and blood sampling were conducted after overnight fasting. Blood pressure was measured with an automatic blood pressure monitor (TM-2655P; A&D Co., Ltd., Tokyo, Japan) on the right upper arm while the subject was in a sitting position. The body mass index (BMI) was calculated by dividing weight (kg) by height squared (m^2). Waist circumference (WC) was measured at the level of the umbilicus while the subject was standing and during slight expiration. High-density lipoprotein cholesterol (HDL-C) and triglyceride (TG) levels were measured by visible spectrophotometry (Determiner L HDL-C, Determiner L TG II; Kyowa Medex Co., Ltd., Tokyo, Japan).

Alanine aminotransferase (ALT) and gamma-glutamyl transpeptidase (γ-GT) levels were measured according to the standardized procedure specified by the Japan Society of Clinical Chemistry. All measurements were included in the routine health checkup examinations.

Fasting serum immunoreactive insulin (IRI) was measured by fluorescence-enzyme immunoassay (ST AIA-PACK IRI; Toso, Tokyo, Japan). The intra- and interassay coefficients of variation were 1.4–2.3 and 2.6–4.6%, respectively, and cross-reactivity with proinsulin molecules was 2.0%. Homeostasis model assessment of insulin resistance (HOMA-IR) was calculated as: FPG (in mg/dL) × IRI (in mU/ mL) / 405 [7]. High sensitivity C-reactive protein (hsCRP) was measured by latex agglutination assays with commercial kits (LZ Test CRP-HG, Eiken Chemical, Tokyo, Japan).

Definition of fatty liver

The diagnosis of fatty liver was based on the results of abdominal ultrasonography, which was done by trained technicians with an Aloka ProSound α10 (Hitachi Aloka Medical, Ltd., Tokyo, Japan).

All ultrasonographic images were stored as photocopies. Two physicians reviewed the photocopies and made the diagnosis of fatty liver without reference to any of the participants' other individual data. The diagnosis of fatty liver was based on hepatorenal echo contrast, liver brightness, deep attenuation, and vascular blurring.

Statistical analysis

Statistical significance for comparisons of HOMA-IR and hsCRP values among the groups with different numbers of components was determined using analysis of variance (ANOVA) and Scheffe's multiple comparison tests.

In order to design a dummy-variable logistic regression model, a series of binary (i.e. dummy) variables that identify whether an observation belongs to a specific category was created. Binary variables were coded as 1 or 0. BMI was classified into the following 5 categories: < 22 kg/m^2, 22 to < 23 kg/m^2, 23 to < 24 kg/m^2, 24 to < 25 kg/m^2, or ≥ 25 kg/m^2. WC was classified into the following 2 categories: < 85 cm or ≥ 85 cm for men and < 90 cm or ≥ 90 cm for women. Systolic blood pressure (SBP) was classified into the following 2 categories: < 130 mmHg or ≥ 130 mmHg. Diastolic blood pressure (DBP) was classified into the following 2 categories: < 85 mmHg or ≥ 85 mmHg. TG levels were classified into the following 3 categories: < 100 mg/dL, 100 to < 150 mg/dL, or ≥ 150 mg/dL. HDL-C levels were classified into the following 2 categories: ≥ 40 mg/dL or < 40 mg/dl for men and ≥ 50 mg/dL or < 50 mg/dL for women. Fasting plasma glucose (FPG) levels were classified into the following 3 categories: < 100 mg/dL, 100 to < 110 mg/dL, or ≥ 110 mg/dL. ALT levels were classified into the following 2 categories: < 31 U/L or ≥ 31 U/L. γ-GT levels was classified into the following 2 categories: < 51 U/L or ≥ 51 U/L. If there were 4 categories, 3 dummy variables were created. The lowest category was used as a reference for BMI, FPG, TG, and SBP, and the highest category was used as a reference for HDL-C. A total of 14 dummy variables were used to predict fatty liver, and a stepwise procedure was used to select an optimal subset of dummy regressors. The probabilities for predicting fatty liver were calculated from the logistic regression equation using the constant and the coefficients for each variable.

A receiver operating characteristic (ROC) curve was prepared in order to evaluate the discriminatory ability for the model that was developed, and the area under the curve (AUC) with its 95% confidence interval (CI) was calculated. In order to determine the optimal cut-off point of the fatty liver predicting index, the square root of $[(1 - \text{sensitivity})^2 + (1 - \text{specificity})^2]$ was calculated, which was the point on the ROC curve with the shortest distance from the upper left corner.

The data were expressed as mean ± standard deviation. SAS software version 9.2 (SAS Institute, Inc., Cary, NC, USA) was used for the statistical analyses. All p

Table 1 Background characteristics of study subjects

	Men (n = 4,042)	Women (n = 3,263)	Total (n = 7,305)
Age (years)	50.3 ± 12.1	49.7 ± 11.8	50.0 ± 11.9
BMI (kg/m^2)	23.9 ± 3.2	21.8 ± 3.3	22.9 ± 3.4
WC (cm)	85.1 ± 8.7	78.8 ± 9.2	82.3 ± 9.5
SBP (mmHg)	120.4 ± 17.1	114.4 ± 17.9	117.7 ± 17.7
DBP (mmHg)	76.9 ± 12.5	70.1 ± 11.7	73.9 ± 12.6
FPG (mg/dL)	103.7 ± 18.7	96.6 ± 15.8	100.5 ± 17.8
HDL-C (mg/dL)	57.4 ± 14.5	71.8 ± 16.4	63.8 ± 16.9
TG (mg/dL)	124.4 ± 85.5	81.8 ± 49.2	105.4 ± 74.7
ALT (U/L)	27.8 ± 20.0	17.7 ± 10.1	23.3 ± 17.1
γ-GT (U/L)	49.3 ± 59.4	23.7 ± 33.0	37.9 ± 51.0
HOMA-IR	1.79 ± 1.54	1.45 ± 1.17	1.64 ± 1.40
hsCRP (mg/dL)	0.11 ± 0.36	0.08 ± 0.40	0.10 ± 0.38
Fatty liver	1,484 (36.7%)	499 (15.3%)	1,983 (27.1%)

Data are mean ± SD.

BMI, body mass index; WC, waist circumference; SBP, systolic blood pressure; DBP, diastolic blood pressure; FPG, fasting plasma glucose; HDL-C, high-density lipoprotein cholesterol; TG, triglyceride; ALT, alanine aminotransferase; γ-GT, γ-glutamyl transpeptidase; HOMA-IR, homeostasis model assessment of insulin resistance, hsCRP, high sensitivity C-reactive protein.

values were two-tailed, and p values less than 0.05 were considered significant.

RESULTS

The clinical characteristics of the subjects are shown in Table 1. The mean ages were 50.3 ± 12.1 for men and 49.7 ± 11.8 for women. The proportions of subjects with fatty liver were 36.7% in men and 15.3% in women.

Fig. 1 shows HOMA-IR values stratified according to MetS and FL. Average HOMA-IR values increased significantly along as the risk increased [MetS(-) & FL(-) < MetS(-) & FL(+) < MetS(+) & FL(-) < MetS(+) & FL(+)], and there were significant differences ($p < 0.01$) among all groups by Scheffe's multiple comparison tests.

Fig. 2 shows hsCRP values stratified according to MetS and FL. Based on Scheffe's multiple comparison test, compared to MetS(-) & FL(-) group, there were significant differences in HOMA-IR at MetS(-) & FL(+) group and MetS(+) & FL(+) group. Compared to MetS(-) & FL(+), there were significant differences in HOMA-IR at MetS(+) & FL(+).

The regression coefficients for each variable are shown in Table 2, where BMI < 22 kg/m^2, TG < 100 mg/dL, FPG < 100 mg/dL, ALT < 31 U/L, and WC < 85 cm for men (< 90 cm for women) were used as references. Because the coefficients of 22 to < 23 kg/m^2 and 23 to < 24 kg/m^2 were almost equal, the BMI categories were combined into 22 to < 24 kg/m^2. If the subject was a man with a BMI of 25 kg/m^2, TG of 150 mg/dL, FPG of 110 mg/dL, ALT of 31 U/L, and WC of 85 cm, the predicted probability was calculated as follows: $y = 1/(1 + \exp^{-2.049}) = 0.886$.

Next, the discriminatory ability of the developed model was tested by a ROC analysis. The ROC curves for the men and women are illustrated in Fig. 3. The AUC (95% CI) was 0.809 (0.795–0.823) for men and 0.878 (0.861–0.895) for women, which showed high predictive values. The optimal cut-off point of the fatty liver-predicting index yielding the minimum value of the square root of [(1 - sensitivity)^2 + (1 - specificity)^2] was 0.365 for men and 0.165 for women. The optimal cut-off point was also the point that maximized the product of sensitivity and specificity, with a sensitivity and specificity of 0.792 and 0.691, respectively, for men and 0.804 and 0.818, respectively, for women. The prevalence was 48.6% in men and 27.7% in women, and the positive predictive value was 59.8% for men and 44.4% for women.

Using the logistic regression model, risk assessment charts to predict the probability of fatty liver were developed (Table 3 and Table 4). These probabilities are displayed in a color-coded manner by combining BMI, TG, FPG, ALT, and WC. Four different colors are displayed on the chart, and these correspond to the following probabilities of fatty liver: < 0.25 (white), 0.25 to < 0.50 (light grey), 0.50 to < 0.75 (grey), and ≥ 0.75 (dark grey). The color gradient tended to proceed from the upper left to the lower right, and the subjects with the highest predicted probability (0.886 for men, 0.952 for women) were found at the lower right corner of the chart.

DISCUSSION

It is thought that insulin resistance increases from early stage of MetS, and that going with the advance in severity of MetS inflammation advances to the onset of arteriosclerotic diseases. The fact that subjects with both MetS and fatty liver have higher HOMA-IR and hsCRP shows the importance to predict the existence of fatty liver as the index of the advance of MetS. Even in subjects with fatty liver without MetS insulin resistance increases significantly, it is thought that they should modify their lifestyles from the point of view of MetS. However, usual health examinations do not include upper abdominal ultrasonography, so it is the aim of this study to develop the index for predicting

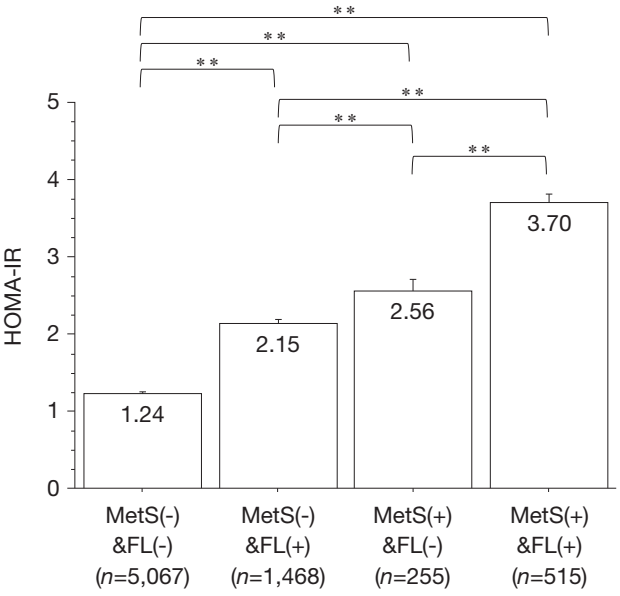

Fig. 1 HOMA-IR values stratified according to MetS and FL.
Data are mean ± SE. HOMA-IR, homeostasis model assessment of insulin resistance; MetS, metabolic syndrome; FL, fatty liver. Statistical significance was determined using Scheffe's multiple-comparison tests.
* $p < 0.05$, ** $p < 0.01$

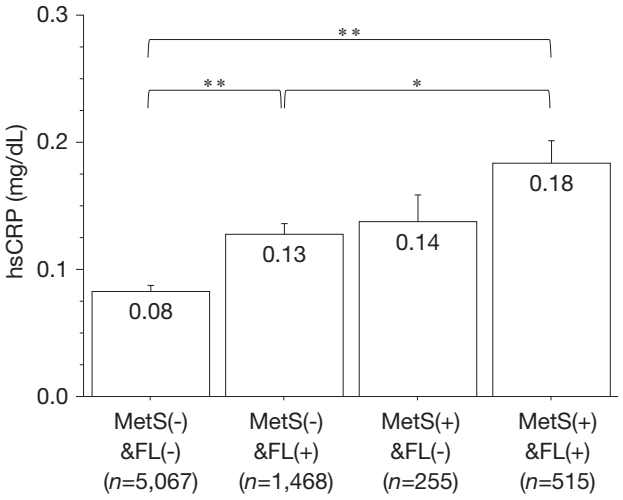

Fig. 2 The hsCRP values stratified according to MetS and FL.
Data are mean ± SE. hsCRP, high-sensitive C-reactive protein; MetS, metabolic syndrome; FL, fatty liver. Statistical significance was determined using Scheffe's multiple-comparison tests.
* $p < 0.05$, ** $p < 0.01$

the existence of fatty liver using tests that are part of usual health checkup examinations.

In the present study, a chart of predicted probabilities of fatty liver was developed using measures of BMI, TG, FPG, ALT, and WC. These results were not influenced by the presence of hypertension, diabetes mellitus, dyslipidemia, or liver disease, or by the past history of cerebrovascular disease, ischemic heart disease, or chronic renal failure. Thus, we did not remove the cases with a presence or past history of these diseases. One of the main strengths of our model was that it enabled us to predict fatty liver using routinely measured parameters, without having to use abdominal ultrasonography. Moreover, the 4-color gradient from the lowest (white) to the highest (dark grey) probability of fatty liver allowed us to see all of the risk levels at a glance.

Kojima *et al.* reported that the prevalence of fatty liver that it detected by medical health checks has increased year after year, from 12.6% in 1989 to 30.3% in 1998 [8]. Tanaka *et al.* reported that approximately 25% of the health checkup examinees had fatty liver [9]. Hamaguchi *et al.* reported that the prevalence of NAFLD was 23.3% in Japanese adults [10]. The proportion of subjects with fatty liver in the present study was 27.1% (36.7% in men and 15.3% in women). This was a rather common proportion for adult Japanese.

Visceral fat accumulation and insulin resistance are usual in MetS. The enhanced insulin resistance caused by the excessive accumulation of body fat (especially visceral fat) is considered to be important in the pathogenesis of fatty liver. The criteria for MetS are useful for the screening of NAFLD. A previous report by Ishibashi *et al.* stated that abdominal circumference was well correlated with NAFLD in men [11]. Hamaguchi *et al.* also showed that the presence of MetS was related to the new onset of NAFLD, with a 4-fold increase in men and an 11-fold increase in women compared to non-MetS subjects [10]. The presence of fatty liver change was significantly correlated with abnormal biometabolic parameters for MetS [12]. Our fatty liver-predicting index consisted of the components of MetS (obesity, hyperglycemia, and dyslipidemia) and ALT, and, thus, this indicated the close relationship of fatty liver and MetS. Metabolic disorders usually worsen with advanced NAFLD [13]. Therefore, a physician may also evaluate ALT levels in patients with MetS.

We observed common components as well as those not shared by MetS and the fatty liver prediction index. Blood pressure and HDL-C were components of MetS. However, both of them were not selected by the fatty liver-predicting index. Moreover, of the liver function tests, ALT was selected, but γ-GT was not selected by the index.

Insulin resistance contributes only modestly to the increased prevalence of hypertension in patients with MetS [14]. The prevalence of MetS among patients with fatty liver is around 30% [15, 16]. Insulin resistance was lower in subjects with fatty liver who were not complicated by MetS, leading to only modest effects on blood pressure. In addition to high insulin resistance that is complicated with obesity, other factors, such as the increased turnover of free fatty acids and increased sympathetic nervous system activity, might be involved in the development of hypertension [5], suggesting that the association between insulin resistance and fatty liver was mild.

Regarding lipids, only TG was selected as a component that was related to fatty liver. Hypertriglyceridemia is typically associated with reductions in HDL-C. Because the relationship of TG to fatty liver was stronger than that of HDL-C, it was thought that only TG was selected in the multivariate analyses. This probably

Table 2 Results of multivariate logistic regression analyses

		Men		Women	
		Coefficient	*OR* (95% CI)	Coefficient	*OR* (95% CI)
BMI	22 to < 24	0.952	2.591 (2.025–3.315)	1.331	3.784 (2.731–5.243)
	24 to < 25	1.226	3.406 (2.512–4.619)	1.735	5.668 (3.766–8.530)
	≥ 25	1.811	6.114 (4.578–8.164)	2.414	11.183 (7.736–16.164)
TG	100 to < 150	0.630	1.877 (1.570–2.245)	0.942	2.565 (1.962–3.355)
	≥ 150	1.007	2.739 (2.278–3.292)	1.628	5.092 (3.582–7.239)
FPG	100 to < 110	0.230	1.259 (1.061–1.495)	0.836	2.308 (1.753–3.038)
	≥ 110	0.670	1.954 (1.609–2.374)	1.555	4.734 (3.416–6.559)
ALT	≥ 31	0.766	2.151 (1.715–2.699)	0.739	2.094 (1.336–3.284)
WC	Men ≥ 85 Women ≥ 90	0.490	1.632 (1.334–1.997)	0.485	1.625 (1.171–2.254)
Constant		- 2.695		- 3.827	

OR, Odds ratio; CI, confidence interval; BMI, body mass index; TG, triglyceride; FPG, fasting plasma glucose; ALT, alanine aminotransferase; WC, waist circumference.

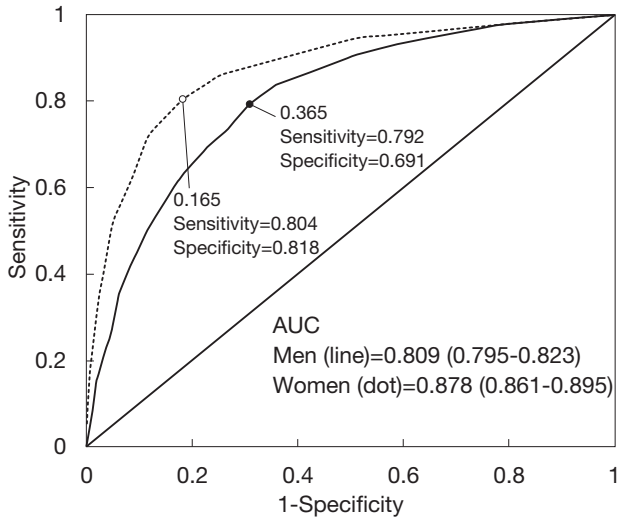

Fig. 3 The ROC curves for men and women. AUC, area under the curve. Data are mean ± SD.

resulted from multicollinearity.

Our previous study showed that ALT levels are closely related to HOMA-IR and γ-GT levels are closely related to hsCRP. The addition of ALT and γ-GT abnormalities to the screening for MetS may be useful for the diagnosis of early-stage MetS and for the detection of cardiovascular risk development [17].

CRP is a general marker of inflammation, making it suitable for assessing in individuals with MetS. Increased levels of CRP are associated with obesity [18–20], insulin resistance [21], and hyperglycemia [18, 22] and they increase with the number of MetS components.

Regarding liver function tests, only ALT was selected as a component that was related to fatty liver. When the objective was subjects with fatty liver, most of the subjects were not complicated with MetS. Thus, the reason why γ-GTP was not selected by the fatty liver prediction index might be due to its strong relationship with CRP.

The specific health examination that was started in 2008 is mainly a qualitative assessment for diagnosing MetS, and, thus, it is difficult to quantitatively assess the improvements or deteriorations of MetS. The specific health examination also includes liver function test (AST, ALT, and γ-GT) as well as other items for diagnosing MetS. Our previous study showed that ALT levels are closely related to HOMA-IR, and γ-GT levels are closely related to hsCRP. The addition of ALT and γ-GT abnormalities to screenings for MetS may be useful for the diagnosis of early-stage MetS and for the detection of cardiovascular risk development [17]. Using the index that we have developed at this time for predicting the existence of fatty liver, enables a quantitative assessment of the severity of MetS by the comparison of numerical values.

Some limitations of our study should be noted. First, although ultrasonography has been validated for detecting fatty liver, it may give an incorrect diagnosis than that by liver biopsies [23]. Second, self-reported information regarding alcohol intake is frequently subject to underreporting, and misreporting could be a source of bias. Third, the generalizability of our study to non-Japanese populations is uncertain.

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Table 3 Risk assessment charts to predict fatty liver in men

FPG	ALT	WC	BMI < 22			BMI 22 to < 24			BMI 24 to <25			BMI ≥ 25		
			TG < 100	TG 100 to < 150	TG ≥ 150	TG < 100	TG 100 to <150	TG ≥ 150	TG < 100	TG 100 to <150	TG ≥ 150	TG < 100	TG 100 to <150	TG ≥ 150
< 100	< 31	< 85	0.063	0.113	0.156	0.149	0.247	0.324	0.187	0.302	0.387	0.292	0.437	0.531
		≥ 85	0.099	0.172	0.232	0.222	0.349	0.439	0.273	0.414	0.507	0.403	0.559	0.649
	≥ 31	< 85	0.127	0.214	0.285	0.274	0.414	0.508	0.331	0.482	0.576	0.471	0.625	0.709
		≥ 85	0.192	0.308	0.394	0.381	0.536	0.627	0.447	0.603	0.689	0.592	0.731	0.799
100 to < 110	< 31	< 85	0.078	0.138	0.189	0.181	0.293	0.376	0.225	0.352	0.442	0.342	0.494	0.588
		≥ 85	0.122	0.207	0.275	0.265	0.403	0.496	0.321	0.470	0.564	0.459	0.614	0.699
	≥ 31	< 85	0.155	0.256	0.334	0.322	0.471	0.565	0.384	0.539	0.631	0.528	0.677	0.754
		≥ 85	0.230	0.359	0.450	0.436	0.592	0.679	0.504	0.656	0.736	0.646	0.774	0.833
≥ 110	< 31	< 85	0.117	0.199	0.266	0.255	0.391	0.484	0.310	0.458	0.552	0.447	0.602	0.689
		≥ 85	0.177	0.288	0.371	0.358	0.512	0.605	0.423	0.580	0.668	0.569	0.712	0.783
	≥ 31	< 85	0.221	0.348	0.438	0.424	0.580	0.668	0.492	0.645	0.726	0.635	0.765	0.826
		≥ 85	0.317	0.465	0.559	0.546	0.693	0.767	0.612	0.748	0.812	0.739	0.842	0.886

Hachioji Hospital.

The authors declare no conflicts of interest associated with the manuscript.

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Table 4 Risk assessment charts to predict fatty liver in women

FPG	ALT	WC	BMI < 22			BMI 22 to < 24			BMI 24 to < 25			BMI ≥ 25		
			TG < 100	TG 100 to < 150	TG ≥ 150	TG < 100	TG 100 to < 150	TG ≥ 150	TG < 100	TG 100 to < 150	TG ≥ 150	TG < 100	TG 100 to < 150	TG ≥ 150
< 100	< 31	< 90	0.021	0.053	0.100	0.076	0.174	0.296	0.110	0.240	0.386	0.196	0.384	0.554
		≥ 90	0.034	0.083	0.153	0.118	0.256	0.405	0.167	0.340	0.505	0.283	0.504	0.668
	≥ 31	< 90	0.044	0.105	0.188	0.147	0.307	0.468	0.205	0.399	0.568	0.338	0.567	0.722
		≥ 90	0.069	0.160	0.274	0.219	0.418	0.588	0.296	0.519	0.681	0.453	0.680	0.808
100 to < 110	< 31	< 90	0.048	0.114	0.204	0.160	0.328	0.492	0.222	0.422	0.592	0.360	0.590	0.741
		≥ 90	0.075	0.173	0.294	0.236	0.442	0.611	0.316	0.543	0.702	0.477	0.701	0.823
	≥ 31	< 90	0.095	0.213	0.349	0.285	0.505	0.670	0.374	0.605	0.752	0.541	0.751	0.857
		≥ 90	0.146	0.305	0.465	0.393	0.624	0.767	0.492	0.713	0.832	0.657	0.831	0.907
≥ 110	< 31	< 90	0.093	0.209	0.344	0.281	0.500	0.665	0.369	0.600	0.748	0.535	0.747	0.854
		≥ 90	0.143	0.300	0.460	0.388	0.619	0.763	0.487	0.709	0.829	0.652	0.828	0.905
	≥ 31	< 90	0.178	0.356	0.524	0.450	0.677	0.806	0.550	0.758	0.862	0.707	0.861	0.925
		90 -	0.260	0.474	0.641	0.570	0.773	0.871	0.665	0.836	0.910	0.797	0.910	0.952

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