

Supplementary Table 1 Univariate and Multivariate OR of Risk Factor for the NAFLD based on ALT Level

ALT level	Unadjusted		Age-adjusted		Multivariate-adjusted	
	OR (95% CI)	P valve	OR (95% CI)	P valve	OR (95% CI)	P valve
<0.5 ULN	1		1		1	
0.5-1 ULN	1.65 (1.50-1.81)	<0.001	1.69 (1.54-1.85)	<0.001	1.37 (1.20-1.47)	<0.001
1-2 ULN	3.56 (3.14-4.02)	<0.001	3.84 (3.39-4.35)	<0.001	2.28 (1.97-2.65)	<0.001
≥2 ULN	6.72 (5.29-8.54)	<0.001	7.82 (6.13-9.98)	<0.001	3.17 (2.31-4.35)	<0.001

Notes: The multivariate model was adjusted for age, sex, race/ethnicity, body mass index, waist circumference, AST, Alb, TG, TC, HDL, smoking status, diabetes, hypertension, and sedentary lifestyle.

Abbreviations: CI, confidence interval; OR, odds ratio.

Supplementary Table 2 Association of ALT level, all-cause, cardiovascular disease, cancer-related and others-related mortality among NAFLD patients

Mortality outcome	NO. of death (%)	Unadjusted		Age-adjusted		Multivariate-adjusted	
		HR (95% CI)	P value	HR (95% CI)	P value	HR (95% CI)	P value
All-cause							
<0.5ULN	450 (48.7)	1		1		1	
0.5-1ULN	876 (41.7)	0.77 (0.69-0.87)	<0.001	0.74 (0.66-0.83)	<0.001	0.75 (0.67-0.85)	<0.001
1-2ULN	302 (33.8)	0.59 (0.51-0.69)	<0.001	0.69 (0.59-0.79)	<0.001	0.66 (0.56-0.78)	<0.001
≥2ULN	67 (27.6)	0.47 (0.36-0.61)	<0.001	0.86 (0.66-1.11)	0.250	0.78 (0.56-1.10)	0.156
Cardiovascular disease							
<0.5ULN	143 (15.5)	1		1		1	
0.5-1ULN	238 (11.3)	0.66 (0.54-0.82)	<0.001	0.64 (0.52-0.79)	<0.001	0.66 (0.52-0.82)	<0.001
1-2ULN	76 (8.5)	0.47 (0.36-0.62)	<0.001	0.56 (0.42-0.74)	<0.001	0.55 (0.39-0.78)	<0.001
≥2ULN	12 (4.9)	0.27 (0.15-0.48)	<0.001	0.52 (0.29-0.94)	<0.001	0.68 (0.31-1.50)	0.342
Cancer							
<0.5ULN	98 (10.6)	1		1		1	
0.5-1ULN	200 (9.5)	0.81 (0.64-1.03)	0.090	0.76 (0.59-0.97)	0.025	0.85 (0.66-1.11)	0.230

1-2ULN	62 (6.9)	0.56 (0.41-0.77)	<0.001	0.61 (0.44-0.84)	0.003	0.77 (0.54-1.12)	0.171
≥2ULN	20 (8.2)	0.64 (0.40-1.04)	0.072	1.04 (0.64-1.69)	0.881	1.39 (0.70-2.75)	0.346
Others							
<0.5ULN	208 (46.3)	1		1		1	
0.5-1ULN	438 (50.0)	0.84 (0.71-0.99)	0.035	0.84 (0.71-0.99)	0.037	0.80 (0.67-0.95)	0.011
1-2ULN	164 (54.3)	0.83 (0.67-1.02)	0.070	0.89 (0.73-1.10)	0.280	0.73 (0.57-0.93)	0.012
≥2ULN	35 (52.2)	0.82 (0.58-1.18)	0.288	0.94 (0.65-1.35)	0.718	0.53 (0.32-0.89)	0.015

Note: The multivariate model was adjusted for age, sex, race/ethnicity, body mass index, waist circumference, AST, Alb, TG, TC, HDL, smoking status, diabetes, hypertension, and sedentary lifestyle.

Others: chronic lower respiratory diseases, accidents (unintentional injuries), cerebrovascular diseases, Alzheimer's diseases, diabetes mellitus, influenza and pneumonia, nephritis, nephrotic syndrome and nephrosis and all other causes (residual).

Abbreviations: CI, confidence interval; HR, hazard ratio.

Supplementary Table 3 Baseline characteristics of patients with NAFLD among men and women

	Men (N=1,932)	Women (N=2,227)	P value
Age	47.9 ± 0.36	45.8 ± 0.34	<0.001
20-39, n, (%)	657 (34.0)	901 (40.5)	<0.001
40-59, n, (%)	665 (34.4)	751 (33.7)	
60-, n, (%)	610 (31.6)	575 (25.8)	
Race/Ethnicity (as%)			
Non-hispanic white	715 (37.0)	771 (34.6)	0.009
Non-hispanic black	430 (22.3)	574 (25.8)	
Mexican American	723 (37.4)	784 (35.2)	
Others	64 (3.3)	98 (4.4)	
Waist Circumference (cm)	101.2 ± 0.33	97.2 ± 0.37	<0.001
BMI (kg/m²)	28.9 ± 0.12	30.1 ± 0.16	<0.001
Hypertension (%)	913 (47.3)	931 (41.8)	<0.001
Diabetes (%)	313 (16.2)	377 (16.9)	0.529
HOMA-IR (%)	1168 (60.5)	1329 (59.7)	0.609
Fasting plasma glucose (mmol/L)	6.1 ± 0.06	6.1 ± 0.06	0.319

HbA1c (%)	5.79 ± 0.03	5.80 ± 0.03	0.392
TG (mg/dL)	194.0 ± 3.12	160.5 ± 2.32	<0.001
Total cholesterol (mg/dL)	210.65 ± 0.97	208.6 ± 0.97	0.068
HDL-cholesterol (mg/dL)	43.5 ± 0.30	51.0 ± 0.33	<0.001
ALT (U/L)	25.2±0.45	18.3 ± 0.38	<0.001
<0.5ULN, n, (%)	501 (25.9)	423 (19.0)	<0.001
0.5-1ULN, n, (%)	965 (49.9)	1134 (50.9)	
1-2ULN, n, (%)	373 (19.3)	520 (23.3)	
≥2ULN, n, (%)	93 (4.8)	150 (6.7)	
AST (IU/L)	25.5 ± 0.39	21.8 ± 0.36	<0.001
Albumin (g/L)	42.4 ± 0.08	40.4 ± 0.08	<0.001
Smoked at least 100 cigarettes (%)	1258 (65.1)	827 (37.1)	<0.001
Sedentary lifestyle (%)	488 (25.3)	933 (41.9)	<0.001
NAFLD (%)			
Mild	660 (34.2)	895 (40.2)	<0.001
Moderate	845 (43.7)	913 (41.0)	
Severe	427 (22.1)	419 (18.8)	

Categorical values are shown as n (%). Continuous variables are shown as mean \pm SEs.

Abbreviations: BMI, body mass index; SBP, systolic blood pressure; DBP, diastolic blood pressure; TC, total cholesterol; TG, triglyceride; HDL, high-density lipoprotein cholesterol; FPG, fasting plasma glucose; HbA1c, glycosylated hemoglobin; ALT, alanine aminotransferase; AST, aspartate aminotransferase; NAFLD, nonalcoholic fatty liver disease.

Supplementary Table 4 Association of different models, all-cause, cardiovascular disease, cancer-related and others-related mortality among NAFLD patients in men

Mortality outcome	NO. of death	Unadjusted		Age-adjusted		Multivariate-adjusted	
		HR(95% CI)	P value	HR(95% CI)	P value	HR(95% CI)	P value
All-cause							
Model 1	586(49.2)	1		1		1	
Model 2	86(27.5)	0.46(0.37-0.58)	<0.001	0.80(0.64-1.01)	0.059	0.79(0.61-1.02)	0.073
Model 3	156(56.9)	1.26(1.06-1.51)	0.009	1.10(0.93-1.32)	0.275	1.00(0.83-1.20)	0.962
Model 4	50(32.7)	0.58(0.44-0.78)	<0.001	0.86(0.65-1.15)	0.321	0.84(0.62-1.15)	0.273
Cardiovascular disease							
Model 1	175(14.7)	1		1		1	
Model 2	27(8.6)	0.50(0.33-0.74)	<0.001	0.88(0.59-1.34)	0.559	0.94(0.58-1.53)	0.794
Model 3	46(16.8)	1.24(0.89-1.71)	0.202	1.07(0.78-1.49)	0.669	0.87(0.62-1.23)	0.435
Model 4	10(6.5)	0.40(0.21-0.75)	0.004	0.60(0.32-1.14)	0.122	0.74(0.37-1.47)	0.384
Neoplasms							
Model 1	137(11.5)	1		1		1	
Model 2	16(5.1)	0.37(0.22-0.62)	<0.001	0.65(0.39-1.10)	0.111	0.78(0.44-1.39)	0.401

Model 3	33(12)	1.13(0.77-1.66)	0.522	0.99(0.67-1.44)	0.937	0.97(0.65-1.43)	0.861
Model 4	14(9.2)	0.69(0.40-1.20)	0.187	1.04(0.60-1.81)	0.890	1.18(0.64-2.17)	0.602
Others							
Model 1	274(46.8)	1		1		1	
Model 2	43(50.0)	0.76(0.55-1.05)	0.100	0.84(0.61-1.17)	0.310	0.79(0.54-1.18)	0.249
Model 3	77(49.4)	1.19(0.92-1.53)	0.183	1.14(0.88-1.47)	0.313	1.09(0.84-1.42)	0.515
Model 4	26(52.0)	0.90(0.60-1.34)	0.598	0.94(0.63-1.42)	0.780	0.75(0.46-1.22)	0.248

Note: Model 1: Mild to Moderate NAFLD with Normal ALT Level; Model 2: Mild to Moderate NAFLD with Elevated ALT Level;

Model 3: Severe NAFLD with Normal ALT Level; Model 4: Severe NAFLD with Elevated ALT Level.

The multivariate model was adjusted for age, race/ethnicity, body mass index, waist circumference, AST, Alb, TG, TC, HDL, smoking status, diabetes, hypertension, and sedentary lifestyle.

Others: chronic lower respiratory diseases, accidents (unintentional injuries), cerebrovascular diseases, Alzheimer's diseases, diabetes mellitus, influenza and pneumonia, nephritis, nephrotic syndrome and nephrosis and all other causes (residual).

Abbreviations: CI, confidence interval; HR, hazard ratio.

Supplementary Table 5 Association of different models, all-cause, cardiovascular disease, cancer-related and others-related mortality among NAFLD patients in women

Mortality outcome	NO. of death	Unadjusted		Age-adjusted		Multivariate-adjusted	
		HR(95% CI)	P value	HR(95% CI)	P value	HR(95% CI)	P value
All-cause							
Model 1	469(35.4)	1		1		1	
Model 2	162(33.6)	0.94(0.78-1.12)	0.469	0.99(0.82-1.18)	0.866	0.86(0.71-1.05)	0.141
Model 3	115(49.8)	1.62(1.32-1.99)	<0.001	1.09(0.89-1.34)	0.399	0.94(0.78-1.17)	0.593
Model 4	71(37.8)	1.13(0.88-1.45)	0.343	0.97(0.75-1.24)	0.789	0.75(0.57-0.99)	0.045
Cardiovascular disease							
Model 1	134(10.1)	1		1		1	
Model 2	41(8.5)	0.83(0.59-1.18)	0.297	0.88(0.62-1.26)	0.489	0.81(0.54-1.21)	0.311
Model 3	26(11.3)	1.28(0.84-1.95)	0.247	0.84(0.55-1.29)	0.430	0.77(0.50-1.19)	0.242
Model 4	10(5.3)	0.56(0.29-1.06)	0.075	0.47(0.25-0.90)	0.023	0.41(0.20-0.82)	0.012
Neoplasms							
Model 1	104(7.8)	1		1		1	
Model 2	34(7.1)	0.88(0.60-1.30)	0.534	0.86(0.59-1.27)	0.460	0.84(0.55-1.29)	0.426

Model 3	24(10.4)	1.50(0.96-2.33)	0.076	1.07(0.69-1.67)	0.766	1.07(0.67-1.70)	0.787
Model 4	18(9.6)	1.28(0.77-2.10)	0.342	1.09(0.66-1.81)	0.726	0.93(0.53-1.65)	0.808
Others							
Model 1	230(49.1)	1		1		1	
Model 2	87(53.7)	1.10(0.85-1.40)	0.477	1.20(0.93-1.54)	0.161	0.99(0.74-1.31)	0.925
Model 3	65(56.5)	1.40(1.06-1.85)	0.018	1.39(1.05-1.84)	0.021	1.24(0.92-1.67)	0.159
Model 4	43(60.6)	1.30(0.94-1.80)	0.120	1.34(0.96-1.86)	0.082	0.99(0.68-1.46)	0.972

Note: Model 1: Mild to Moderate NAFLD with Normal ALT Level; Model 2: Mild to Moderate NAFLD with Elevated ALT Level;

Model 3: Severe NAFLD with Normal ALT Level; Model 4: Severe NAFLD with Elevated ALT Level.

The multivariate model was adjusted for age, race/ethnicity, body mass index, waist circumference, AST, Alb, TG, TC, HDL, smoking status, diabetes, hypertension, and sedentary lifestyle.

Others: chronic lower respiratory diseases, accidents (unintentional injuries), cerebrovascular diseases, Alzheimer's diseases, diabetes mellitus, influenza and pneumonia, nephritis, nephrotic syndrome and nephrosis and all other causes (residual).

Abbreviations: CI, confidence interval; HR, hazard ratio.

Supplementary Table 6 Baseline characteristics of NAFLD patients with minimum and maximum ALT level among men and women

ALT level	Men (N=1,932)			Women (N=2,227)		
	<0.5ULN (N=501)	≥2ULN (N=93)	P valve	<0.5ULN (N=423)	≥2ULN (N=150)	P valve
Age	53.1±0.78	35.4±1.15	<0.001	42.9±0.81	42.4±1.07	0.671
20-39,n,(%)	133(26.5)	67(72.0)	<0.001	208(49.2)	73(48.7)	<0.001
40-59,n,(%)	120(24.0)	23(24.7)		113(26.7)	61(40.7)	
60-,n,(%)	248(49.5)	3(3.2)		102(24.1)	16(10.7)	
Race/Ethnicity(as%)			<0.001			<0.001
Non-hispanic white	209(41.7)	16(17.2)		161(38.1)	38(25.3)	
Non-hispanic black	159(31.7)	5(5.4)		169(40.0)	12(8.0)	
Mexican American	125(25.0)	69(74.2)		79(18.7)	93(62.0)	
Others	8(1.6)	3(3.2)		14(3.3)	7(4.7)	
Waist Circumference(cm)	97.0±0.70	102.7±1.32	<0.001	91.1±0.90	103.4±1.16	<0.001
BMI(kg/m2)	26.8±0.24	30.2±0.57	<0.001	27.8±0.38	32.8±0.55	<0.001
Hypertension(%)	239(47.7)	38(40.9)	0.224	169(40.0)	58(38.7)	0.782
Diabetes(%)	73(14.6)	12(12.9)	0.673	49(11.6)	33(22.0)	0.002
HOMA-IR(>2.5)	220(43.9)	69(74.2)	<0.001	255(60.3)	23(15.3)	<0.001

Fasting glucose(mmol/L)	plasma 6.02±0.12	6.30±0.44	0.396	5.55±0.11	6.28±0.19	0.001
HbA1c(%)	5.78±0.06	5.73±0.15	0.764	5.55±0.06	5.99±0.11	<0.001
TG(mg/dL)	152.4±4.80	249.5±18.34	<0.001	126.7±4.24	192.7±9.65	<0.001
Total cholesterol(mg/dL)	206.0±1.94	213.6±4.92	0.152	199.0±2.16	212.0±3.45	0.002
HDL-cholesterol (mg/dL)	47.1±0.65	41.1±1.12	<0.001	54.6±0.79	46.2±1.44	<0.001
ALT(IU/L)	11.1±0.11	89.2±3.77	<0.001	7.6±0.07	63.4±3.64	<0.001
AST(IU/L)	18.6±0.21	61.4±5.88	<0.001	14.9±0.13	56.7±3.97	<0.001
Albumin(g/L)	41.6±0.16	43.6±0.35	<0.001	39.7±0.18	41.1±0.30	<0.001
Smoked at least 100 cigarettes(%)	359(71.7)	44(47.3)	<0.001	176(41.6)	55(36.7)	0.289
Sedentary lifestyle(%)	138(27.5)	24(25.8)	0.730	160(37.8)	62(41.3)	0.449
NAFLD(%)			<0.001			<0.001
Mild	230(45.9)	15(16.1)		220(52.0)		
Moderate	209(41.7)	45(48.4)		71(47.3)		
Severe	62(12.4)	33(35.5)		51(34.0)		

Note: Categorical values are shown as n (%). Continuous variables are shown as mean ± SEs.

Abbreviations: BMI, body mass index; HOMA-IR, homeostasis model assessment of insulin resistance; HbA1c, glycosylated hemoglobin; TG, triglyceride; HDL, high-density lipoprotein cholesterol; ALT, alanine aminotransferase; AST, aspartate aminotransferase; NAFLD, nonalcoholic fatty liver disease.