Supplementary Material 1

18.03.2024

PubMed: 268 articles

(("Apolipoproteins"[Mesh]) OR ("Apolipoproteins"[All Fields]) OR ("Apolipoprotein A-I"[Mesh]) OR ("Apolipoprotein A-I"[All Fields]) OR ("Apolipoproteins B"[Mesh]) OR ("Apolipoproteins B"[All Fields])) AND (("Non-alcoholic Fatty Liver Disease"[Mesh]) OR ("Non-alcoholic Fatty Liver Disease"[All Fields]) OR ("MAFLD") OR ("Metabolic dysfunction associated fatty liver disease") OR ("metabolic-dysfunction associated fatty liver disease") OR ("MASLD") OR ("Metabolic dysfunction associated steatotic liver disease") OR ("Metabolic-dysfunction associated steatotic liver disease"))

EMBASE: article, preprint, human filters – 496 articles

('Apolipoproteins'/exp OR 'Apolipoproteins' OR 'Apolipoprotein A-I'/exp OR 'Apolipoprotein A-I' OR 'Apolipoproteins B'/exp OR 'Apolipoproteins B') AND ('Non-alcoholic Fatty Liver Disease'/exp OR 'Non-alcoholic Fatty Liver Disease' OR 'MAFLD' OR 'Metabolic dysfunction associated fatty liver disease' OR 'metabolic-dysfunction associated fatty liver disease' OR 'MASLD' OR 'Metabolic dysfunction associated steatotic liver disease' OR 'Metabolic-dysfunction associated steatotic liver disease')

Scopus: 8 articles – title, abstract, keywords

(("Apolipoproteins") OR ("Apolipoprotein A-I") OR ("Apolipoproteins B") AND (("Non-alcoholic Fatty Liver Disease") OR ("MAFLD") OR ("Metabolic dysfunction associated fatty liver disease") OR ("metabolic-dysfunction associated fatty liver disease") OR ("MASLD") OR ("Metabolic dysfunction associated steatotic liver disease") OR ("Metabolic-dysfunction associated steatotic liver disease"))

All articles: 772 articles

Supplementary Material 2

List of excluded articles

1. Ahmed L, Salama H, Ahmed R, Hamdy S, Al-Akel W, Shafi SA, Mahgoub A, Hareedy A, Fathy W. Non-invasive fibrosis seromarkers as a predictor of liver fibrosis in chronic hepatitis C and/or non-alcoholic steatohepatitis. Arab J Gastroenterol. 2009 Mar;10(1):14-20. doi: 10.1016/j.ajg.2009.03.007. Epub 2009 May 3. PMID: 24842131.

2. Alboraie M, Schütte K, Khairy M, Elsharkawy M, Asem N, Elghamry F, Shalaby H, Esmat G, Malfertheiner P. Validation of Hepa-index as a non-invasive biomarkers panel for assessment of hepatic fibrosis in Egyptians with chronic hepatitis C. Saudi Med J. 2017 Nov;38(11):1137-1142. doi: 10.15537/smj.2017.11.21220. PMID: 29114703; PMCID: PMC5767618.

3. Chan DC, Watts GF, Gan S, Wong AT, Ooi EM, Barrett PH. Nonalcoholic fatty liver disease as the transducer of hepatic oversecretion of very-low-density lipoprotein-apolipoprotein B-100 in obesity. Arterioscler Thromb Vasc Biol. 2010 May;30(5):1043-50. doi: 10.1161/ATVBAHA.109.202275. Epub 2010 Feb 11. PMID: 20150556.

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5. Cheng Q, Yuan X, Lin S, Zhao Y, Wang H, Zhu F, Wang Y, Xu T, Wu J, Wang K, Zhang J, Sun X, Li C, Liang H, Fang L, Xue B. Serum proteome profiling reveals differentially expressed proteins between subjects with metabolically healthy obesity and nonalcoholic fatty liver disease. J Proteomics. 2022 May 30;260:104556. doi: 10.1016/j.jprot.2022.104556. Epub 2022 Mar 11. PMID: 35283354.

6. Chiou YL, Chyau CC, Li TJ, Kuo CF, Kang YY, Chen CC, Ko WS. Hepatoprotective Effect of *Antrodia cinnamomea* Mycelium in Patients with Nonalcoholic Steatohepatitis: A Randomized, Double-Blind, Placebo-Controlled Trial. J Am Coll Nutr. 2021 May-Jun;40(4):349-357. doi: 10.1080/07315724.2020.1779850. Epub 2020 Jul 13. PMID: 32657670.

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9. Ekhlasi G, Kolahdouz Mohammadi R, Agah S, Zarrati M, Hosseini AF, Arabshahi SS, Shidfar F. Do symbiotic and Vitamin E supplementation have favorite effects in nonalcoholic fatty liver disease? A randomized, double-blind, placebo-controlled trial. J Res Med Sci. 2016 Nov 2;21:106. doi: 10.4103/1735-1995.193178. PMID: 28250783; PMCID: PMC5322689.

10. Faghihzadeh F, Adibi P, Hekmatdoost A. The effects of resveratrol supplementation on cardiovascular risk factors in patients with non-alcoholic fatty liver disease: a randomised,

double-blind, placebo-controlled study. Br J Nutr. 2015 Sep 14;114(5):796-803. doi: 10.1017/S0007114515002433. Epub 2015 Aug 3. PMID: 26234526.

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Supplementary Table 1. Main characteristics of the included articles

<table>
<tr><th>First Author /Year / Country</th><th>Study Design</th><th>Study Characteristics</th><th>Main Findings</th></tr>
<tr><td>Park SH et al/ 2004 / Korea</td><td>Cross-sectional study</td><td>
Population: Non-obese Asian men
Total subjects: 360
NAFLD diagnosis: ALT≥40 and US
NAFLD (120)
BMI: 23.4 ±0.10
Mean age (years): 42.8 ±0.88
Gender (males): 120
Values: ApoA1 (mg/dL): 112.4 ±1.69
ApoB (mg/dL): 116.6 ±2.13
Control (240)
BMI: 23.2 ±0.06
Mean age (years): 42.5 ±0.52
Gender (males): 240
Values: ApoA1 (mg/dL): 119.1 ±1.23
ApoB (mg/dL): 111.3 ±0.78
</td><td>Significant lower levels of apolipoproteins in the control group</td></tr>
<tr><td>Poynard T et al / 2006 / France</td><td>Prospective cohort study</td><td>
Population: NASH patients
Total subjects: 424
NAFLD diagnosis: Liver biopsy
Training Group No NASH (57)
BMI: n.a.
Mean age (years): 53.7 ±1.5
Gender (males): 35
Values: ApoA1 (g/L): 1.54 ±0.04
Training Group Borderline NASH (75)
BMI: n.a.
Mean age (years): 52.6 ±1.3
Gender (males): 49
Values: ApoA1 (g/L): 1.41 ±0.04
Training Group NASH (28)
BMI: n.a.
Mean age (years): 54.2 ±2.1
Gender (males): 12
Values: ApoA1 (g/L): 1.49 ±0.06
Validation Group No NASH (41)
BMI: n.a.
</td><td>No significant differences in apolipoproteins profile between groups</td></tr>
</table>

		• **Mean age (years):** 44.8 ±1.8 • **Gender (males):** 21 • **Values:** ApoA1 (g/L): 1.71 ±0.10 **Validation Group Borderline NASH** (21) • **BMI:** n.a. • **Mean age (years):** 47.3 ±2.8 • **Gender (males):** 17 • **Values:** ApoA1 (g/L): 1.48 ±0.15 **Validation Group NASH** (35) • **BMI:** n.a. • **Mean age (years):** 53.6 ±2.1 • **Gender (males):** 19 • **Values:** ApoA1 (g/L): 1.51 ±0.11 **Validation and Training Group No NASH** (98) • **BMI:** n.a. • **Mean age (years):** 49.4 ±1.2 • **Gender (males):** 56 • **Values:** ApoA1 (g/L): 1.61 ±0.05 **Validation and Training Group Borderline NASH** (96) • **BMI:** n.a. • **Mean age (years):** 51.4 ±1.2 • **Gender (males):** 66 • **Values:** ApoA1 (g/L): 1.43 ±0.05 **Validation and Training Group NASH** (63) • **BMI:** n.a. • **Mean age (years):** 53.8 ±1.5 • **Gender (males):** 31 • **Values:** ApoA1 (g/L): 1.50 ±0.06	
Ratziu V et al / 2006 / France	Prospective cohort study	• **Population**: Group 1: hospitalized patients with suspicion of NAFLD Group 2: Subjects of prospective multicenter study CYTOL • **Total subjects:** 534 • **NAFLD diagnosis:** Liver biopsy **Group 1 NAFLD** (170) • **BMI>27kg/m^2:** 85 • **Mean age (years):** 52.8 ±0.87 • **Gender (males):** 98 • **Values:** ApoA1 (g/L): 1.47 ±0.03	Significant changes in apolipoproteins profile related to the severity of the fibrosis

		Group 2 NAFLD (97) • **BMI>27kg/m^2:** 44 • **Mean age (years):** 48.5 ±1.28 • **Gender (males):** 57 • **Values:** ApoA1 (g/L): 1.59 ±0.07 **Group 1 F0-1** (130) • **BMI>27kg/m^2:** n.a. • **Mean age (years):** 50.4 ±1 • **Gender (males):** 78 • **Values:** ApoA1 (g/L): 1.48 ±0.03 **Group 1 F2-4** (40) • **BMI>27kg/m^2:** n.a. • **Mean age (years):** 60.4 ±1.4 • **Gender (males):** 20 • **Values:** ApoA1 (g/L): 1.43 ±0.06 **Group 2 F0-1** (66) • **BMI>27kg/m^2:** n.a. • **Mean age (years):** 50.3 ±1.4 • **Gender (males):** 39 • **Values:** ApoA1 (g/L): 1.63 ±0.10 **Group 2 F2-4** (31) • **BMI>27kg/m^2:** n.a. • **Mean age (years):** 55.4 • **Gender (males):** 18 • **Values:** ApoA1 (g/L): 1.49 ±0.05	
Demirag et al/ 2007 /Turkey	Case-control study	• **Population**: NAFLD patients • **Total subjects:** 438 • **NAFLD diagnosis:** US **NAFLD** (237) • **BMI:** 28.9 ±4.6 • **Mean age (years):** 45.1 ±9.3 • **Gender (males):** 123 • **Values:** ApoA (mg/dL): 119.2 ±26.1 ApoB (mg/dL): 119.9 ±35.6 **Control** (201) • **BMI:** 25.8 ±3.8 • **Mean age (years):** 43.7 ±9.9 • **Gender (males):** 102 • **Values:** ApoA (mg/dL): 128.6 ±30.3 ApoB (mg/dL): 123.1 ±34.3	No significant differences in apolipoproteins profile between groups

Fabbrini E et al / 2007 / Greece	Prospective cohort study	• **Population**: Obese population with NAFLD and control • **Total subjects:** 28 • **NAFLD diagnosis:** MRS (IHTG >10%) **NAFLD (IHTG >10%)** (14) • **BMI:** 36.8 ±1.2 • **Mean age (years):** 45 ±3 • **Gender (males):** 3 • **Values:** VLDL-ApoB100 (mg/L): 52 ±8 Total ApoB100 (mg/L): 736 ±55 **Normal intrahepatic TG (IHTG ≤5.5%)** (14) • **BMI:** 35.3 ±1.3 • **Mean age (years):** 41 ±3 • **Gender (males):** 3 • **Values:** VLDL-ApoB100 (mg/L): 36 ±5 Total ApoB100 (mg/L): 677 ±36	Fatty acids derived from non-systemic sources are responsible for the increase in VLDL- secretion
Gambino R et al / 2007 / Italy	Prospective cohort study	• **Population**: Patients With NASH and control • **Total subjects:** 56 • **NAFLD diagnosis:** Liver biopsy **Controls GG** (13) • **BMI:** 25 ±0.7 • **Mean age (years):** 35 ±2 • **Gender (males):** 12 • **Values (mg/dL):** ApoB(mg/dL): 82 ±6 VLDL A-ApoB48(mg/dL): 0.33 ±0.18 VLDL B-ApoB48(mg/dL): 0.40 ±0.20 VLDL C-ApoB48(mg/dL): 1.36 ±0.41 VLDL-DApoB48(mg/dL): 1.89 ±0.35 VLDL-AApoB100(mg/dL): 1.06 ±0.08 VLDL B-ApoB100(mg/dL): 1.40 ±0.36 VLDL C-ApoB100(mg/dL): 4.87 ±1.49 VLDL-DApoB100(mg/dL): 6.70 ±1.26 **Controls GT/TT** (14) • **BMI:** 25.1 ±0.8 • **Mean age (years):** 37 ±2 • **Gender (males):** 11 • **Values:** ApoB(mg/dL): 83 ±6 VLDL A-ApoB48(mg/dL): 0.12 ±0.10 VLDL B-ApoB48(mg/dL): 0.22 ±0.13 VLDL C-ApoB48(mg/dL): 1.42 ±0.38 VLDL-DApoB48(mg/dL): 2.49 ±0.35 VLDL-AApoB100(mg/dL): 0.17 ±0.08 VLDL B-ApoB100(mg/dL): 0.71 ±0.12	Significant differences in apolipoproteins profile between groups

		VLDL C-ApoB100(mg/dL): 5.25 ±1.51 VLDL-DApoB100(mg/dL): 9.21 ±1.57 **NASH GG** (19) • **BMI:** 25.1 ±0.8 • **Mean age (years):** 39 ±2 • **Gender (males):** 16 • **Values:** ApoB(mg/dL): 84±5 VLDL A-ApoB48(mg/dL): 1.33 ±0.64 VLDL B-ApoB48(mg/dL): 0.85 ±0.32 VLDL C-ApoB48(mg/dL): 0.48 ±0.21 VLDL-DApoB48(mg/dL): 0.74 ±0.38 VLDL-AApoB100(mg/dL): 4.38 ±0.85 VLDL B-ApoB100(mg/dL): 2.33 ±1.19 VLDL C-ApoB100(mg/dL): 0.69 ±0.25 VLDL-DApoB100(mg/dL): 1.47 ±0.85 **NASH GT/TT** (10) • **BMI:** 25.6 ±0.9 • **Mean age (years):** 37 ±3 • **Gender (males):** 8 • **Values:** ApoB(mg/dL): 86 ±5 VLDL A-ApoB48(mg/dL): 0.62 ±0.23 VLDL B-ApoB48(mg/dL): 0.61 ±0.21 VLDL C-ApoB48(mg/dL): 0.44 ±0.27 VLDL-DApoB48(mg/dL): 1.48 ±0.47 VLDL-AApoB100(mg/dL): 2.39 ±1.21 VLDL B-ApoB100(mg/dL): 1.21 ±0.38 VLDL C-ApoB100(mg/dL): 3.33 ±1.11 VLDL-DApoB100(mg/dL): 5.07 ±1.19	
Park SH et al / 2007 / Korea	Cross-sectional study	• **Population**: Overweight men with NAFLD patients and control • **Total subjects:** 234 • **NAFLD diagnosis:** US **NAFLD** (117) • **BMI:** 27.1 ±0.13 • **Mean age (years):** 43.1 ±0.84 • **Gender (males):** 117 • **Values:** ApoA1 (mg/dL): 123.6 ±2.13 ApoB (mg/dL): 112.9 ±1.85 **Control** (117) • **BMI:** 27.0 ±0.09 • **Mean age (years):** 43.5 ±0.89 • **Gender (males):** 117 • **Values:** ApoA1 (mg/dL): 122.4 ±1.66	Significant lower level of ApoB in the control group

		ApoB (mg/dL): 105.5 ±1.78	
Moustafa AH et al / 2009 / Egypt	Case-control study	• **Population**: Patients with different liver diseases and controls • **Total subjects:** 110 • **NAFLD diagnosis:** US **NASH** (13) • **BMI:** n.a. • **Mean age (years):** 55 ±4.6 • **Gender (males):** 8 • **Values:** ApoA1 (mg/dL): 113 ±25 **Control** (20) • **BMI:** n.a. • **Mean age (years):** 51 ±9.3 • **Gender (males):** 16 • **Values:** ApoA1 (mg/dL): 111.4 ±24.5	No significant differences in apolipoproteins profile between groups
Lucero D et al / 2010 / Argentina	Cross-sectional study	• **Population**: Subjects attending the Metabolism Section from Endocrinology division • **Total subjects:** 75 • **NAFLD diagnosis:** US **Healthy** (25) • **BMI:** 24.1 ±4.3 • **Mean age (years):** 44 ±16 • **Gender (males):** 7 • **Values:** ApoA1 (mg/dL): 162 ±38 ApoB (mg/dL): 105 ±30 **MS without NAFLD** (25) • **BMI:** 34.4 ±5.8 • **Mean age (years):** 46 ±16 • **Gender (males):** 7 • **Values:** ApoA1 (mg/dL): 138 ±21 ApoB (mg/dL): 115 ±31 **MS with NAFLD** (25) • **BMI:** 36.0 ±6.0 • **Mean age (years):** 46 ±17 • **Gender (males):** 7 • **Values:** ApoA1 (mg/dL): 140 ±24 ApoB (mg/dL): 116 ±36	Higher level of apolipoproteins in MS-NAFLD group
Tanaka N et al / 2011 / Japan	Prospective cohort study	• **Population**: Patients subjected to PD • **Total subjects:** 60 • **NAFLD diagnosis:** Abdominal CT and liver biopsy **Post-PD-non-NAFLD** (46)	Significant higher levels in post-PD non-NAFLD group

		• **BMI:** 20 (16.5-27) • **Mean age (years):** 72 (37-91) • **Gender (males):** 26 • **Values:** ApoB (mg/dL): 75 (46-147) **Post-PD-NAFLD** (14) • **BMI:** 16.3 (14.8-22.1) • **Mean age (years):** 70 (60-82) • **Gender (males):** 4 • **Values:** ApoB (mg/dL): 49 (29-88)	
Choe Y et al / 2012 / Korea	Cross-sectional study	• **Population**: Participants of health check-up program South Korea • **Total subjects:** 9162 • **NAFLD diagnosis:** US **NAFLD** (2554) • **BMI:** 25.63 ±2.61 • **Mean age (years):** 42.49 ±5.13 • **Gender (males):** 2110 • **Values:** ApoA1 (mg/dL): 147.92 ±19.18 ApoB (mg/dL): 111.01 ±21.56 ApoB/A1 ratio: 0.76 ±0.18 **Control** (6608) • **BMI:** 22.38 ±2.53 • **Mean age (years):** 43.5 ±0.89 • **Gender (males):** 2945 • **Values:** ApoA1 (mg/dL): 157.9 ±21.65 ApoB (mg/dL): 93.51 ±21.41 ApoB/A1 ratio: 0.60 ±0.17	The ApoB/AI ratio was associated with the prevalence of NAFLD in non- diabetic subjects and was independent of obesity and other metabolic components
Miksztowicz V et al / 2012 / Argentina	Case-control study	• **Population**: Healthy subjects from hospital employes volunteers NAFLD from referred patients for diagnosis • **Total subjects:** 78 • **NAFLD diagnosis:** US **NAFLD** (48) • **BMI:** 33.9 ±6.2 • **Mean age (years):** 47 ±10 • **Gender (males):** 14 • **Values:** ApoA1 (mg/L): 13.9 ±2.3 ApoB100 (mg/L): 10.9±2.8 **Control** (30) • **BMI:** 24.5 ±5.1 • **Mean age (years):** 37 ±14 • **Gender (males):** 12 • **Values:** ApoA1 (mg/L): 16.4 ±3.9	Significant higher level of ApoB100 in NAFLD group, but significant low levels of ApoA1

		ApoB100 (mg/L): 9.0 ±3.1	
Forbes S et al /2013 / UK	Prospective cohort study	• **Population**: White women after pregnancy with non-diabetic glucose tolerance • **Total subjects:** 36 • **NAFLD diagnosis:** US **pGDM-/NAFLD-** (11) • **BMI:** 26.6 ±0.5 • **Mean age (years):** 40 ±2 • **Gender (female):** 11 • **Values:** ApoB (g/L): 0.80 ±0.07 **pGDM+/NAFLD-** (9) • **BMI:** 26.5 ±0.6 • **Mean age (years):** 41 ±1 • **Gender (female):** 9 • **Values:** ApoB (g/L): 0.95 ±0.05 **pGDM-/NAFLD+** (8) • **BMI:** 27.6 ±0.8 • **Mean age (years):** 42 ±2 • **Gender (female):** 8 • **Values:** ApoB (g/L): 0.95 ±0.06 **pGDM+/NAFLD+** (8) • **BMI:** 27.5 ±0.9 • **Mean age (years):** 42 ±2 • **Gender (males):** 8 • **Values:** ApoB (g/L): 1.08 ±0.09	No significant differences in apolipoproteins profile between groups
Miller MH et al / 2014 / Australia	Prospective cohort study	• **Population**: NAFLD, NASH and controls • **Total subjects:** 118 • **NAFLD diagnosis:** Liver biopsy **Control** (30) • **BMI:** n.a. • **Mean age (years):** n.a. • **Gender (males):** n.a • **Values:** ApoA2 (mcg/mL): 149.98 ±49.1 ApoB100 (mcg/mL): 221.36 ±109.4 ApoE (mcg/mL): 39.77 ±11.6 **NAFLD** (48) • **BMI:** n.a. • **Mean age (years):** n.a. • **Gender (males):** n.a. • **Values:** ApoA2 (mcg/mL): 175.71 ±66.3 ApoB100 (mcg/mL): 282.92 ±128 ApoE (mcg/mL): 62.73 ±25.1 **SS** (8)	Significant differences in apolipoproteins profile between groups

		• **BMI:** n.a. • **Mean age (years):** n.a. • **Gender (males):** n.a. • **Values:** ApoA2 (mcg/mL): 176.43 ±74.6 ApoB100 (mcg/mL): 246.81 ±151.8 ApoE (mcg/mL): 55.83 ±17.3 **NASH** (40) • **BMI:** n.a. • **Mean age (years):** n.a. • **Gender (males):** n.a. • **Values:** ApoA2 (mcg/mL): 175.57 ±65.6 ApoB100 (mcg/mL): 290.14 ±123.6 ApoE (mcg/mL): 64.1 ±26.3 **F0** (12) • **BMI:** n.a. • **Mean age (years):** n.a. • **Gender (males):** n.a. • **Values:** ApoA2 (mcg/mL): 158.62 ±53.2 ApoB100 (mcg/mL): 274.59 ±123.4 ApoE (mcg/mL): 56.39 ±16 **F1-2** (25) • **BMI:** n.a. • **Mean age (years):** n.a. • **Gender (males):** n.a. • **Values:** ApoA2 (mcg/mL): 169.19 ±65.5 ApoB100 (mcg/mL): 271.95 ±124 ApoE (mcg/mL): 62.87 ±26.9 **F3-4** (25) • **BMI:** n.a. • **Mean age (years):** n.a. • **Gender (males):** n.a. • **Values:** ApoA2 (mcg/mL): 199.85 ±67.3 ApoB100 (mcg/mL): 319.84 ±140.4 ApoE (mcg/mL): 62.23 ±18.8	
Niu TH et al / 2014 / China	Cross-sectional study	• **Population**: Unrelated adult subjects of both sexes, including unrelated Chinese patients • **Total subjects:** 797 • **NAFLD diagnosis:** US **Non-carrier w/NAFLD** (96) • **BMI:** 25.21± 2.48 • **Mean age (years):** 49.16±17.23 • **Gender (males):** 48 • **Values:** ApoC3 (mg/L): 13.6 ±1.90 (n=19)	No significant differences in apolipoproteins profile between groups

		Carrier w/NAFLD (294) • **BMI:** 24.7 ±2.91 • **Mean age (years):** 49.96±15.83 • **Gender (males):** 137 • **Values:** ApoC3 (mg/dL): 14.37±1.98 (n=80) • **Non-carrier control** (101) • **BMI:** 22.14±4.07 • **Mean age (years):** 46.8±16.51 • **Gender (males):** 39 • **Values:** ApoC3 (mg/dL): 15.22 ±1.79 (n=15) **Carrier control**(308) • **BMI:** 22.19± 4.10 • **Mean age (years):** 47.98 ±15.65 • **Gender (males):** 159 • **Values:** ApoC3 (mg/dL): 14.2±1.89 (n=66)	
Bril F et al /2015 / USA	Cross-sectional study	• **Population**: Patients recruited from outpatient clinics or from the general population • **Total subjects:** 312 • **NAFLD diagnosis:** Liver biopsy **Obese NAFLD** (101) • **BMI:** 35.7 ±0.4 • **Mean age (years):** 58 ±1 • **Gender (males):** 84 • **Values:** ApoB/A1 ratio: 0.66 ±0.02 **Obese non-NAFLD** (31) • **BMI:** 34.5 ±0.6 • **Mean age (years):** 61 ±2 • **Gender (males):** 26 • **Values:** ApoB/A1 ratio: n.a. **Non-obese NAFLD** (28) • **BMI:** 28.1 ±0.4 • **Mean age (years):** 62 ±2 • **Gender (males):** 25 **Values:** ApoB/A1 ratio: 0.58 ±0.02 **Non-obese non-NAFLD** (28) • **BMI:** 27.1 ±0.5 • **Mean age (years):** 60 ±2 • **Gender (males):** 21 • **Values:** ApoB/A1 ratio: n.a.	Severity of steatohepatitis did not significantly influence the lipoprotein profile

		NASH (91) • **BMI:** 35±0.4 • **Mean age (years):** 58 ±1 • **Gender (males):** 81 • **Values:** ApoB/A1 ratio: n.a. **Non- NASH** (33) • **BMI:** 32.8±0.8 • **Mean age (years):** 61±1 • **Gender (males):** 28 • **Values:** ApoB/A1 ratio: n.a.	
Chunming L et al / 2015 / China	Observational retrospective study	• **Population**: Patients admitted to hospital from July 2006 to March 2013 • **Total subjects:** 82 • **NAFLD diagnosis:** US and liver biopsy **NASS** (54) • **BMI:** 26.02 ±1.71 • **Mean age (years):** 45.44 ±14.34 • **Gender (males):** 32 • **Values:** ApoA (g/L): 1.26 ±0.27 ApoB (g/L): 0.96±0.26 ApoB/A1 ratio: 0.78 ±0.21 **NASH** (28) • **BMI:** 27.97 ±1.55 • **Mean age (years):** 47.17 ±13.17 • **Gender (males):** 17 • **Values:** ApoA (g/L): 1.29 ±0.44 ApoB (g/L): 1.20±0.27 ApoB/A1 ratio: 0.98 ±0.29 AUC ApoB/ApoA1: 0.712	ApoB/ApoA1 ratio was a good score to predict the presence of NASH
Ozel BD et al / 2015 / Turkey	Case-control study	• **Population**: Internal medicine outpatient clinic patient • **Total subjects:** 55 **NAFLD diagnosis:** Liver biopsy (not in control) **NASH** (30) • **BMI:** 30 ±4.7 • **Mean age (years):** 41 ±11 • **Gender (males):** 15 **Values:** ApoA1 (mg/dL): 127.7 ±17.7 ApoB (mg/dL): 102.5±29.9 ApoB/A1 ratio: 0.8 ±0.25 **Control** (25) • **BMI:** 27 ±3 • **Mean age (years):** 39 ±9.7 • **Gender (males):** 13	Significant higher levels of ApoB and ApoB/A1 ratio in NASH group

		Values: ApoA1 (mg/dL): 137.6 ±29 ApoB (mg/dL): 78.8±16.9 ApoB/A1 ratio: 0.6 ±0.26	
Garcia A et al/ 2015 / USA	Cross-sectional study	• **Population**: Class 3 obese woman • **Total subjects:** 111 • **NAFLD diagnosis:** Liver biopsy **All Lean** (9) • **BMI:** 22.5 ±0.8 • **Mean age (years):** 40.2 ±2 • **Gender (female):** 9 • **Values:** ApoB100 (mg/dL): n.a. **All Obese normal** (18) • **BMI:** 45.4 ±1.3 • **Mean age (years):** 38.8±1.4 • **Gender (female):** 18 • **Values:** ApoB100 (mg/dL): 106.2 ±5.1 **All Obese SS** (16) • **BMI:** 43.1 ±1.3 • **Mean age (years):** 43.7±2.9 • **Gender (female):** 16 • **Values:** ApoB100 (mg/dL): 120.8 ±7.5 **All Obese NASH** (17) • **BMI:** 43.9 ±1.6 • **Mean age (years):** 47.2 ±6.3 • **Gender (female):** 16 • **Values:** ApoB100 (mg/dL): 103.6 ±6.1 **Caucasian Obese Normal** (13) • **BMI:** n.a. • **Mean age (years):** n.a. • **Gender (female):** 13 • **Values:** ApoB100 (mg/dL): 111.5 ±4.7 **Caucasian Obese SS** (11) • **BMI:** n.a. • **Mean age (years):** n.a. • **Gender (female):** 11 • **Values:** ApoB100 (mg/dL): 131 ±7.6 **Caucasian Obese NASH** (17) • **BMI:** n.a.	ApoB100 and lipoprotein subclass particle number and size can delineate steatosis from NASH in obese Caucasian females

		• **Mean age (years):** n.a. • **Gender (female):** 17 • **Values:** ApoB100 (mg/dL): 103.6 ±6.1 **African American Obese normal** (5) • **BMI:** n.a. • **Mean age (years):** n.a. • **Gender (female):** 5 • **Values:** ApoB100 (mg/dL): 92.6 ±12.5 **African American Obese SS** (5) • **BMI:** n.a. • **Mean age (years):** n.a. • **Gender (female):** 5 • **Values:** ApoB100 (mg/dL): 98.4 ±13.4	
Onat A et al / 2015 / Turkey	Prospective cohort study	• **Population**: Middle-aged adults • **Total subjects:** 1822 • **NAFLD diagnosis:** Estimation hepatic steatosis **by** an algorithm (based on BMI, waist-circum., TG, GGT) **Men non-NAFLD FLI<30** (198) • **BMI:** 24.1±3.3 • **Mean age (years):** 52.8 ±12.7 • **Gender (males):** 198 • **Values:** ApoA1 (g/L): 1.40 ±0.24 ApoB (g/L): 0.94±0.26 **Men probable NAFLD FLI 30-59** (263) • **BMI:** 27.2±2.7 • **Mean age (years):** 53.4 ±12 • **Gender (males):** 263 • **Values:** ApoA1 (g/L): 1.35 ±0.24 ApoB (g/L): 1.05±0.19 **Men NAFLD FLI ≥60** (416) • **BMI:** 30.9 ±4 • **Mean age (years):** 51.7 ±9.3 • **Gender (males):** 416 • **Values:** ApoA1 (g/L): 1.346 ±0.24 ApoB (g/L): 1.09±0.29 **Women non-NAFLD FLI <30** (252) • **BMI:** 26.2 ±4.4 • **Mean age (years):** 47.5 ±10.3 • **Gender (females):** 416 • **Values:** ApoA1 (g/L): 1.55 ±0.30	Significant higher level of ApoB between groups

		ApoB (g/L): 1.03±0.27 **Women probable NAFLD FLI 30-59** (241) • **BMI:** 30.2 ±3.8 • **Mean age (years):** 51.9 ±10.5 • **Gender (females):** 241 • **Values:** ApoA1 (g/L): 1.51 ±0.26 ApoB (g/L): 1.04±0.28 **Women NAFLD FLI ≥60** (452) • **BMI:** 34.5±5.5 • **Mean age (years):** 54.8±9.9 • **Gender (females):** 452 • **Values:** ApoA1 (g/L): 1.50 ±0.28 ApoB (g/L): 1.13±0.31	
Privitera G et al / 2015 / Italy	Cross-sectional study	• **Population**: NAFLD patients • **Total subjects:** 132 • **NAFLD diagnosis:** US **NAFLD mild steatosis** (49) • **BMI:** 33 ±6 • **Mean age (years):** 43 ±14 • **Gender (males):** 13 • **Values:** ApoB/A1 ratio: 0.60±0.1 ApoB: 95±23 ApoA1: 161±36 **NAFLD moderate/severe steatosis** (83) • **BMI:** 35 ±6 • **Mean age (years):** 47 ±12 • **Gender (males):** 40 • **Values:** ApoB/A1 ratio: 0.74±0.2 ApoB: 109±24 ApoA1: 154±27	No significant differences in apolipoproteins profile between groups
Siddiqui MS et al / 2015 / USA	Case-control study	• **Population**: Nondiabetic subjects with histologically confirmed NAFLD, lean and obese individuals without NAFLD • **Total subjects:** 243 • **NAFLD diagnosis:** Liver biopsy **Lean Normal** (81) • **BMI:** 22.3±1.7 • **Mean age (years):** 57 ±11 • **Gender (males):** 58 • **Values:** ApoB (mg/dL): 89±22 ApoA1 (mg/dL): 168±32 ApoB/A1: 0.56±0.20 **Obese Normal** (81)	Significant changes in apolipoproteins profile between groups

		• **BMI:** 32.5±6.1 • **Mean age (years):** 54 ±13 • **Gender (males):** 57 • **Values:** ApoB (mg/dL): 87±23 ApoA1 (mg/dL): 154±34 ApoB/A1: 0.59±0.20 **NAFLD** (81) • **BMI:** n.a. • **Mean age (years):** n.a. • **Gender (males):** n.a. • **Values:** ApoB (mg/dL): 101±31 ApoA1 (mg/dL): 148±30 ApoB/A1: 0.70±0.26 **NAFLD** (32) • **BMI:** n.a. • **Mean age (years):** n.a. • **Gender (males):** n.a. • **Values:** ApoB (mg/dL): **97**±26 ApoA1 (mg/dL): 154±26 ApoB/A1: 0.66±0.23 **Steatohepatitis** (35) • **BMI:** 33.2 ±6.2 • **Mean age (years):** 56 ±13 • **Gender (males):** 11 • **Values:** ApoB (mg/dL): 103±34 ApoA1 (mg/dL): 144±31 ApoB/A1: 0.74±0.27 **Cirrhosis** (14) • **BMI:** 34.7 ±6.0 • **Mean age (years):** 61 ±8 • **Gender (males):** 3 • **Values:** ApoB (mg/dL): 81±25 ApoA1 (mg/dL): 136±49 ApoB/A1: 0.54±0.31	
Shukla A et al / 2015 / India	Prospective cohort study	• **Population**: NAFLD patients • **Total subjects:** 51 • **NAFLD diagnosis:** US and liver biopsy **NAFLD with minimal or no fibrosis** (40) • **BMI >30:** 30 • **Mean age (years):** 49.2 ±11.1 • **Gender (males):** n.a. • **Values:** ApoA1 (mg/dL): 160.35±54.1	No significant changes in apolipoproteins between the two groups

		NAFLD with advanced fibrosis (11) • **BMI>30:** 8 • **Mean age (years):** 54.7±12.0 • **Gender (males):** n.a. • **Values:** ApoA1 (mg/dL): 129.10±46.2 AUROC: 0.76 (cut-off value 140mg/dL)	
Wang J et al / 2016 / China	Prospective cohort study	• **Population**: Healthy adults • **Total subjects:** 6948 • **NAFLD diagnosis:** US and liver biopsy **Developed NAFLD (**1139) • **BMI:** 24.12 ±2.32 • **Mean age (years):** 43.3±12 • **Gender (males):** 876 • **Values:** ApoB (g/L): 1.00 ±0.25 **Did not develop NAFLD (**5809) • **BMI:** 22.36 (2.40) • **Mean age (years):** 44.7±13 • **Gender (males):** 3572 • **Values:** ApoB (g/L): **0**.91 ±0.24	Elevated apoB levels independently predict an increased risk for incident NAFLD
Mladenovic B et al/ 2017 / Serbia	Cross-sectional study	• **Population**: AFLD and NAFLD patients • **Total subjects:** 144 • **NAFLD diagnosis:** US **AFLD** (74) • **BMI:** n.a. • **Mean age (years):** 42.65±9.73 • **Gender (males):** 46 • **Values:** ApoB (g/L): 3.97±0.28 ApoA1 (g/L): 0.49±0.091 ApoB/A1: 2.43±1.27 **NAFLD (70**) • **BMI:** n.a. • **Mean age (years):** 41.31±4.1 • **Gender (males):** 44 • **Values:** ApoB (g/L): 2.38±0.16 ApoA1 (g/L): 0.98±0.04 ApoB/A1: 7.81±1.42	Lipids and the ApoB/ApoA1 ra- can serve as a diagnostic criterium for the presence of AFLD

Nass KJ et al / 2017 / Netherlands	Case-control study	• **Population**: Participants from Lifelines cohort • **Total subjects:** 22865 • **NAFLD diagnosis:** US **NAFLD (FLI ≥60) (4790)** • **BMI:** 30.8 (28.6-33.8) • **Mean age (years):** 46 (40-53) • **Gender (males):** 2711 • **Values:** ApoB (g/L): 1.06±0.24 ApoA1 (g/L): 1.39±0.23 ApoB/A1: 0.78±0.21 **Control (FLI<60) (18075)** • **BMI:** 24.4 (22.5-26.5) • **Mean age (years):** 43 (34-50) • **Gender (males):** 5972 • **Values:** ApoB (g/L): 0.88±0.22 ApoA1 (g/L): 1.53±0.26 ApoB/A1: 0.59±0.19	ApoB levels alteration may contribute to increased CVD risk associated with NAFLD
Eremic-Kojic N et al / 2018 / Serbia	Cross-sectional pilot study	• **Population**: Obese patients with or without NAFLD • **Total subjects:** 77 • **NAFLD diagnosis:** US **NAFLD (44)** • **BMI:** 34.38±9.73 • **Mean age (years):** 42.34±6.57 • **Gender (males):** 23 • **Values:** ApoA1 (g/L): 1.39±0.21 ApoB (g/L): 1.11±0.24 **Control (33)** • **BMI:** 28.05±4.79 • **Mean age (years):** 39.36±6.4 • **Gender (males):** 12 • **Values:** ApoA1 (g/L): 1.38±0.16 ApoB (g/L): 1.08±0.29	No significant differences in apolipoproteins profile between groups
Fadaei R et al / 2018 / Iran	Case-control study	• **Population**: Patients recruited from Shariati hospital (Iran) • **Total subjects:** 82 • **NAFLD diagnosis:** US **NAFLD (49)** • **BMI:** 28±0.4 • **Mean age (years):** 51 (47-54) • **Gender (males):** n.a. • **Values:** ApoA1 (ng/mL): 95.1±2.3 ApoB (ng/mL): 109.7±2.1 ApoB/A1: 1.185±0.036	Apo B/apo A-I was associated with cIMT in NAFLD patients

		Control (33) • **BMI:** 25±0.6 • **Mean age (years):** 50 (47-49) • **Gender (males):** n.a. • **Values:** ApoA1 (ng/mL): 120.9±4.3 ApoB (ng/mL): 102.4±2.9 ApoB/A1: 0.888±0.044	
McCullough A et al / 2019/ USA	Prospective cohort study	• **Population**: Healthy subjects from general population NAFLD from outpatient clinics • **Total subjects:** 24 • **NAFLD diagnosis:** Liver biopsy **NAFLD** (15) • **BMI:** 34.7 (26.9,48.9) • **Mean age (years):** 58 (43-65) • **Gender (males):** 7 • **Values:** ApoB100 (mg/dL): 96.7±24.9 ApoA1 (mg/dL): 129.2±13.3 ApoB100/A1: 0.75±0.19 ApoA1/HDLC: 3.2±0.7 **Control (**liver fat <5% (9)) • **BMI:** 30.8 (23.7-35.4) • **Mean age (years):** 50 (35-66) • **Gender (males):** 4 • **Values:** ApoB100 (mg/dL): 76.5±12.5 ApoA1 (mg/dL): 128.3±20.4 ApoB100/A1: 0.60±0.09 ApoA1/HDLC: 2.5±0.4 **SS** (7) • **BMI:** 37.7±7.9 • **Mean age (years):** 56.2 ±6.7 • **Gender (males):** 2 • **Values:** ApoB100 (mg/dL): 100.3±20.7 ApoA1 (mg/dL): 133.5±13.7 ApoB100/A1: 0.76±0.19 ApoA1/HDLC: 3.20±1.04 **NASH** (8) • **BMI:** 33.7±2.5 • **Mean age (years):** 60.0±4.5 • **Gender (males):** 5 • **Values:** ApoB100 (mg/dL): 93.6±26.1 ApoA1 (mg/dL): 125.6±10.6 ApoB100/A1: 0.74±0.17 ApoA1/HDLC: 3.17±0.37	HDL metabolism and function are altered in NAFLD without any significant differences between SS and NASH
Ren XY et al / 2019 / China	Prospective cohort study	• **Population**: Jinchang cohort • **Total subjects:** 32121 • **NAFLD diagnosis:** US	Good accuracy to predict NAFLD

		NAFLD (2026) • **BMI:** 26.25± 4.04 • **Mean age (years):** 48.36±13.53 • **Gender (males):** n.a. **Control** (30095) • **BMI:** 23.07± 3.12 • **Mean age (years):** 46.58±13.88 • **Gender (males):** n.a. • **Values:** AUC ApoB/A1: 0.613 (0.605-0.622)	
Trojak A et al / 2019 / Poland	Cross-sectional study	• **Population**: T2DM diagnosed at least 2 years before inclusion • **Total subjects:** 116 • **NAFLD diagnosis:** US **NAFLD** (79) • **BMI:** 33.44 ±5.12 • **Mean age (years):** 57.3±10.6 • **Gender (males):** n.a. • **Values:** ApoC3 (mcg/mL): 243.7±123.6 ApoB48 (ng/mL): 3459.5±3105 (n=78) ApoB100 (mg/dL): 87.8±26.93 ApoA1 (mg/dL): 140.29±28.53 **Control** (37) • **BMI:** 31.23±6.842 • **Mean age (years):** 62.9±11.21 • **Gender (males):** n.a. • **Values:** ApoC3 (mcg/mL): 208.2±131 (n=36) ApoB48 (ng/mL): 4529±3959 ApoB100 (mg/dL): 91.06±23.35 ApoA1 (mg/dL): 144.26±29.49	No significant changes in apolipoproteins profile between groups
Van den Berg EH, 2019, Netherlands	Cross-sectional study	• **Population**: Subjects from PREVEND study • **Total subjects:** 6762 • **NAFLD diagnosis:** FLI≥60 **FLI<60** (4928) • **BMI:** 24.4 ± 2.90 • **Mean age (years):** 47.8± 12.5 • **Gender (males):** 2100 **Values:** ApoA1 (g/L): 1.420±0.302 ApoB (g/L): 0.972±0.284 ApoE (g/L): 0.036±0.012 **FLI≥60** (1834) • **BMI:** 30.5 ± 3.92 • **Mean age (years):** 55.2± 11.6	Significant changes in the levels of apolipoproteins between groups

		• **Gender (males):** 1261 • **Values:** ApoA1 (g/L): 1.304±0.272 ApoB (g/L): 1.185±0.307 ApoE (g/L): 0.045±0.017	
Zhang P et al / 2019 / China	Case-control study	• **Population**: NAFLD and healthy control subjects • **Total subjects:** 176 • **NAFLD diagnosis:** Imaging or liver biopsy **NAFLD** (88) • **BMI:** 27.55±3.56 • **Mean age (years):** 50.95±12.08 • **Gender (males):** 38 • **Values:** ApoA1 (mmol/L): 1.27±0.21 ApoB (g/L): 0.69 (0.62,0.81) **Control** (88) • **BMI:** 24.05±3.15 • **Mean age (years):** 52.3±11.23 • **Gender (males):** 28 • **Values:** ApoA1 (g/L): 1.42±0.23 ApoB (g/L): 0.65 (0.55,0.76)	Atg7 was negatively associatede with ApoB levels
Huang H et al / 2020 / China	Case-control study	• **Population**: Sample obtained from adults who took annual health exam • **Total subjects:** 9025 • **NAFLD diagnosis:** US **NAFLD** (3038) • **BMI:** 25.10 (23.53-27) • **Mean age (years):** 52 (43-63) • **Gender (males):** 2389 • **Values:** ApoA1 (mmol/L): 1.18 (1.05-1.32) HDL-C/ApoA1 (mmol/L): 1.00 (0.88-1.13) **Control** (5987) • **BMI:** 22 (20.4-23.7) • **Mean age (years):** 49 (39-62) • **Gender (males):** 3842 • **Values:** ApoA1 (mmol/L): 1.27 (1.12-1.46) HDL-C/ApoA1 (mmol/L): 1.02 (0.91-1.13)	Increased HDL-C/apo A-I is significantly associated with a decreased risk of NAFLD

Patel S et al / 2020 / USA	Cross-sectional study	**Population**: All patients undergoing liver transplant **Total subjects:** 84 **NAFLD diagnosis:** Liver biopsy **Liver cirrhosis** (28) **BMI:** n.a. **Mean age (years):** n.a. **Gender (males):** n.a. **Values:** ApoA1 (g/L): 146.3±29.2 ApoB (g/L): 73±26.4 **NASH without cirrhosis** (56) **BMI:** n.a. **Mean age (years):** n.a **Gender (males):** n.a. **Values:** ApoA1 (mg/dL): 136.1±24.2 ApoB (mg/dL): 101.4±29.8	Significant lower levels of ApoB in cirrhotic patients
Zhang Y et al / 2020 / China	Cross-sectional study	**Population**: Patients with fatty liver and controls **Total subjects:** 167 **NAFLD diagnosis:** US **NAFL** (63) **BMI:** n.a. **Mean age (years):** 38.92±9.8 **Gender (males):** 42 **Values:** ApoA1 (g/L): 1.43±0.24 ApoB (g/L): 0.92 ±0.20 **NASH** (23) **BMI:** n.a. **Mean age (years):** 40.63±10.65 **Gender (males):** 16 **Values:** ApoA1 (g/L): 1.46±0.27 ApoB (g/L): 0.92 ±0.22 **Control** (81) **BMI:** n.a. **Mean age (years):** 38.94 ±5.40 **Gender (males):** 53 **Values:** ApoA1 (g/L): 1.52±0.27 ApoB (g/L): 0.79 ±0.16	Abnormal apolipoprotein/lipoprotein is closely related to lipid metabolism disorder in patients with NAFLD
Zong Y et al / 2020 / China	Prospective cohort study	**Population**: Subjects from prospective population study in Shanghai **Total subjects:** 274 **NAFLD diagnosis:** US **Non-diabetic control** (67)	No significant changes in apolipoproteins profile between groups

		• **BMI:** 24.39±1.96 • **Mean age (years):** 57.87±6.84 • **Gender (males):** 47 • **Values:** ApoA (mmol/L): 1.39±0.28 ApoB (mmol/L): 0.89 ±0.17 ApoE (mmol/L): 4.26±1.56 **Non-diabetic NAFLD** (73) • **BMI:** 24.89±2.14 • **Mean age (years):** 57.28±6.66 • **Gender (males):** 50 • **Values:** ApoA (mmol/L): 1.4±0.26 ApoB (mmol/L): 0.93±0.17 ApoE (mmol/L): 5.07±2.01 **Diabetic control** (68) • **BMI:** 27.28±6.66 • **Mean age (years):** 57.28±6.83 • **Gender (males):** 46 • **Values:** ApoA (mmol/L): 1.45±0.30 ApoB (mmol/L): 0.87±0.15 ApoE (mmol/L): 4.34±1.77 **Diabetic NAFLD** (66) • **BMI:** 27.21±6.46 • **Mean age (years):** 57.21±6.46 • **Gender (males):** 46 • **Values:** ApoA (mmol/L): 1.38±0.33 ApoB (mmol/L): 0.94±0.15 ApoE (mmol/L): 4.85±1.66	
Esteve-Luque V et al / 2021/ Spain	Cross-sectional study	• **Population**: Patients with primary HTG • **Total subjects:** 185 • **NAFLD diagnosis:** US **Non/mild NAFLD** (89) • **BMI:** 28.1±3.8 • **Mean age (years):** 53.3±10.7 • **Gender (males):** 62 • **Values:** ApoB (mg/L): 1.13±0.3 ApoA1 (mg/L): 1.39 ±0.20 **Mod/severe NAFLD** (96) • **BMI:** 29.6±3.9 • **Mean age (years):** 52.1±9.8 • **Gender (males):** 74	No significant differences in apolipoproteins profile between groups

		Values: ApoB (mg/L): 1.20±0.40 ApoA1 (mg/L): 1.36 ±0.20	
Hou X et al / 2021 / China	Prospective cohort study	**Population**: Chinese adults **Total subjects:** 472 **NAFLD diagnosis:** US **NAFLD** (155) **BMI:** 28.97±3.83 **Mean age (years):** 47±11 **Gender (males):** 85 **Values:** ApoA1 (mg/L): 1.34 (1.20,1.51) ApoB (mg/L): 0.88±0.23 ApoA1/B: 1.57 (1.28,1.86) **Control** (317) **BMI:** 24.45±3.25 **Mean age (years):** 43±14 **Gender (males):** 139 **Values:** ApoA1 (g/L): 1.42 (1.27,1.60) ApoB (g/L): 0.75±0.20 ApoA1/B: 1.94 (1.61,2.36)	Significant differences in apolipoproteins profile between groups
Wu T et al / 2021 / China	Observational retrospective study	**Population**: 10,453 individuals **Total subjects:** 10,453 **NAFLD diagnosis:** US **NAFLD** (3519) **BMI:** 25.9±4 **Mean age (years):** 46.1± 14.5 **Gender (males):** 2146 **Values:** ApoA1 (g/L): 1.24 ± 0.34 ApoB (g/L): 0.98±0.27 ApoE(mg/L): 47± 16 **Control** (6934) **BMI:** 22.6±3 **Mean age (years):** 46.6±14.4 **Gender (males):** 4186 **Values:** ApoA1 (g/L): 1.26 ± 0.34 ApoB (g/L): 0.89±0.28 ApoE(mg/L): 42± 10	The novel risk score considering US defined steatosis grades, non-invasive liver fibrosis scores and apolipoprotein profiles accurately predicted the 10-year risk of CVD
Wu T et al / 2021 / China	Cross-sectional study	**Population**: MAFLD and non-MAFLD subjects **Total subjects:** 1182	LFC was associated with lipid profiles, including triglyceride, LDL-c, ApoB, ApoE, and FFA

		• **NAFLD diagnosis:** US, MRI-PDFF **Non-MAFLD** (144) • **BMI:** 24.8±2.8 • **Mean age (years):** 41.6± 11.2 • **Gender (males):** 84 • **Values:** ApoA1 (g/L): 1.26 ± 0.22 ApoB (g/L): 0.86±0.19 ApoE(mg/L): 43± 16 **All MAFLD** (1038) • **BMI:** 26.8±3.6 • **Mean age (years):** 41.4± 12.2 • **Gender (males):** 774 • **Values:** ApoA1 (g/L): 1.26 ± 0.22 ApoB (g/L): 0.95±0.22 ApoE(mg/L): 45± 16 **MAFLD overweight/obese** (838) • **BMI:** 27.6±3.2 • **Mean age (years):** 40.4± 11.9 • **Gender (males):** 658 • **Values:** ApoA1 (g/L): 1.24 ± 0.20 ApoB (g/L): 0.96±0.22 ApoE(mg/L): 46± 17 **MAFLD lean/normal weight** (128) • **BMI:** 26.7±2.9 • **Mean age (years):** 43.1± 12.8 • **Gender (males):** 77 • **Values:** ApoA1 (g/L): 1.34 ± 0.30 ApoB (g/L): 0.90±0.23 ApoE(mg/L): 42± 12 **MAFLD T2DM** (72) • **BMI:** 26.7±2.9 • **Mean age (years):** 51± 12.4 • **Gender (males):** 39 • **Values:** ApoA1 (g/L): 1.32±0.22 ApoB (g/L): 0.96±0.26 ApoE(mg/L): 47± 21	
Bril F et al / 2022 / USA	Cross-sectional study	• **Population**: Participants enrolled from general population and hepatology/ endocrinology clinics • **Total subjects:** 185 • **NAFLD diagnosis:** H-MRS followed by liver biopsy **NAFLD with F0-F2** (114)	Patients with NAFLD with advanced fibrosis showed significant differences in HDL-bound protein levels

		BMI: 34.5± 4.6 **Mean age (years):** 52± 11 **Gender (males):** 87 **Values:** ApoA1 (mol/mol): 0.27 ± 0.09 ApoC1 (mol/mol): 0.06±0.02 ApoC2 (mol/mol): 0.023± 0.012 ApoC3 (mol/mol): 0.055± 0.029 ApoC4 (mol/mol): 0.0014± 0.0007 ApoA2 (mol/mol): 1.13± 0.64 ApoA4 (mol/mol): 0.0008± 0.0006 ApoD (mol/mol): 0.0091± 0.0052 ApoE (mol/mol): 0.006± 0.005 ApoL1 (mol/mol): 0.0022± 0.0015 ApoM (mol/mol): 0.0086± 0.0038 **NAFLD with advanced fibrosis** (26) **BMI:** 34.2± 4.3 **Mean age (years):** 54± 9 **Gender (males):** 20 **Values:** ApoA1 (mol/mol): 0.23 ± 0.06 ApoC1 (mol/mol): 0.045±0.015 ApoC2 (mol/mol): 0.019± 0.008 ApoC3 (mol/mol): 0.045± 0.023 ApoC4 (mol/mol): 0.0011± 0.0005 ApoA2 (mol/mol): 0.91± 0.26 ApoA4 (mol/mol): 0.0008± 0.0005 ApoD (mol/mol): 0.0069± 0.0031 ApoE (mol/mol): 0.004± 0.002 ApoL1 (mol/mol): 0.0018± 0.0005 ApoM (mol/mol): 0.0066± 0.0017 **Control** (45) **BMI:** 30.8± 5.1 **Mean age (years):** 55± 11 **Gender (males):** 30 **Values:** n.a.	
Hu C et al / 2022 / China	Cross-sectional study	**Population**: Chinese in- and outpatient in digestive department (age between 35 and 70) **Total subjects:** 300 **NAFLD diagnosis:** US **NAFLD+T2DM** (100) **BMI:** n.a. **Mean age (years):** n.a. **Gender (males):** n.a. **Values:** ApoA: 1.22 ± 0.02 ApoB: 0.91±0.02 **T2DM** (100)	Significant higher values of apolipoproteins in NAFLD+T2DM group

		• **BMI:** n.a. • **Mean age (years):** n.a. • **Gender (males):** n.a. • **Values:** ApoA: 1.11 ± 0.02 ApoB: 0.87±0.03 **NAFLD** (100) • **BMI:** n.a. • **Mean age (years):** n.a. • **Gender (males):** n.a. • **Values:** ApoA: 1.22 ± 0.03 ApoB: 0.97±0.04	
Ismaiel A et al / 2022/ Romania	Cross-sectional study	• **Population**: Patients admitted at the Clinical Emergency County Hospital Cluj-Napoca • **Total subjects:** 75 • **NAFLD diagnosis:** US and SteatoTest **MAFLD** (38) • **BMI:** 30.3 (28.1-33.3) • **Mean age (years):** 54 (48-59) • **Gender (males):** 18 • **Values:** ApoA1: 1.33± 0.19 **Control** (37) • **BMI:** 22.1 (20.1-24.8) • **Mean age (years):** 30 (27-40) • **Gender (males):** 17 • **Values:** ApoA1: 1.52± 0.22	No significant differences in apolipoproteins profile between groups
Lawitz EJ et al / 2022 / USA	Prospective cohort study	• **Population**: Subjects from US and New Zealand • **Total subjects:** 123 • **NAFLD diagnosis:** Liver biopsy **Non-cirrhotic NAFLD** (103) • **BMI:** 36.25 (31.2,41.83) • **Mean age (years):** 55 (48,61) • **Gender (males):** 33 • **Values:** ApoA1(mg/dL): 140 (125,162) ApoB (mg/dL): 94 (80,107) **Cirrhotic NAFLD** (20) • **BMI:** 30.39 (28.2,37.13) • **Mean age (years):** 61.5 (55.5,67) • **Gender (males):** 7 • **Values:** ApoA1(mg/dL): 131 (120,138) ApoB (mg/dL): 84.5 (74.5,113.5)	No significant differences in apolipoproteins profile between groups

Li X et al/ 2022 / China	Cross-sectional study	• **Population**: Long-term hospitalized with schizophrenia • **Total subjects:** 310 • **NAFLD diagnosis:** US **NAFLD** (170) • **BMI:** 26.95±3.61 • **Mean age (years):** 48.36±11.67 • **Gender (males):** 94 • **Values:** ApoA1(g/L): 1.16 ±0.24 ApoB (g/L): 0.80 (0.68,0.94) **Non-NAFLD** (140) • **BMI:** 22.13±3.22 • **Mean age (years):** 47.81±13.30 • **Gender (males):** 84 • **Values:** ApoA1(g/L): 1.19 ±0.24 ApoB (g/L): 0.66 (0.54,0.82)	ApoB was identified as negative factors for NAFLD in the evaluated patients
Ye J et al / 2022 / China	Cross sectional and prospective cohort study	• **Population**: MAFLD patients from different cohorts • **Total subjects:** 315773 • **NAFLD diagnosis:** Cross-sectional study and international cohort MRI-PDFF Chinese validation cohort: US, International cohort: FLI ≥60 **Cross-sectional study MAFLD** (1038) • **BMI:** 26.8±3.6 • **Mean age (years):** 41.3±12.4 • **Gender (males):** 774 • **Values:** ApoA1(g/L): 1.26 ±0.22 ApoB (g/L): 0.95 ±0.22 ApoE (mg/mL): 45 ±16 **Cross-sectional study non-MAFLD** (143) • **BMI:** 24.8±2.8 • **Mean age (years):** 41.6±11.2 • **Gender (males):** 84 • **Values:** ApoA1(g/L): 1.26 ±0.22 ApoB (g/L): 0.86 ±0.19 ApoE (mg/mL): 43 ±16 **Chinese cohort MAFLD** (3494) • **BMI:** 25.9±3.7 • **Mean age (years):** 46.1±13.6 • **Gender (males):** 2144 • **Values:** ApoA1(g/L): 1.24 ±0.33 ApoB (g/L): 0.98 ±0.27 ApoE (mg/mL): 47 ±17	Significant changes in apolipoproteins profile between groups

		Chinese cohort non-MAFLD (6957) • **BMI:** 22.6±3.4 • **Mean age (years):** 46.7±12.5 • **Gender (males):** 4189 • **Values:** ApoA1(g/L): 1.26 ±0.34 ApoB (g/L): 0.89 ±0.27 ApoE (mg/mL): 41 ±11 **International cohort MAFLD** (106408) • **BMI:** 31.3±4.4 • **Mean age (years):** 56.7±7.9 • **Gender (males):** 67909 • **Values:** ApoA1(g/L): 1.44 ±0.23 ApoB (g/L): 1.10±0.25 **International cohort non-MAFLD** (197733) • **BMI:** 24.9±2.8 • **Mean age (years):** 56.1±8.2 • **Gender (males):** 69555 • **Values:** ApoA1(g/L): 1.60 ±0.27 ApoB (g/L): 1.00±0.22 **International cohort MAFLD with MRI_PDFF** (1010) • **BMI: 29**.3±4.3 • **Mean age (years):** 55.9±7.4 • **Gender (males): 594** • **Values:** ApoA1(g/L): 1.45 ±0.24 ApoB (g/L): 1.08±0.24 **International cohort non-MAFLD with MRI PDFF** (3601) • **BMI:** 25.9±3.9 • **Mean age (years):** 55.4±7.7 • **Gender (males): 1586** • **Values:** ApoA1(g/L): 1.57 ±0.26 ApoB (g/L): 1.02±0.22	
Zhao Y et al / 2022 / China	Cross-sectional study	• **Population**: 3341 participants • **Total subjects:** 3341 **NAFLD diagnosis:** US **MAFLD** (1114) • **BMI:** 26.67±2.74 • **Mean age (years):** 50.52±8.94 • **Gender (males):** 818 • **Values:** ApoA1(g/L): 1.22 (1.14-1.31) ApoB (g/L): 1.04 (0.89-1.18) ApoB/A1: 0.85 (0.72-0.97)	The apo B/A 1 ratio was a risk factor of the presence of MAFLD

		Control (2227) • **BMI:** 23.34±2.72 • **Mean age (years):** 48.81±9.86 • **Gender (males):** 1225 • **Values:** ApoA1(g/L): 1.26 (1.16-1.36) ApoB (g/L): 0.92 (0.79-1.07) ApoB/A1: 0.73 (0.61-0.86)	
Björnson E et al / 2023 / Sweden	Prospective cohort study	• **Population**: Swedish people from two different cohort studies • **Total subjects:** 4161 **NAFLD diagnosis:** CT scan (<50 HU) **NAFLD** (786) • **BMI:** 30.2 (27.5,33.4) • **Mean age (years):** 58.6 (54.5,61.9) • **Gender (males):** 541 • **Values:** ApoB(g/L): 1.20 (1.0,1.4) **Control** (3375) • **BMI:** 25.6 (23.4-28.1) • **Mean age (years):** 57.4 (53.6,61.3) • **Gender (males):** 1395 • **Values:** ApoB (g/L): 1.10 (0.92-1.2)	Significant higher levels of apolipoproteins in NAFLD group
Dandan M et al/ 2023 / USA	Case-control study	• **Population**: NASH patients • **Total subjects:** 60 **NAFLD diagnosis:** Liver biopsy **NASH** (28) • **BMI:** 34.3 (31.5,36.9) • **Mean age (years):** 59 (47,64) • **Gender (males):** 12 • **Values:** ApoA1 (mg/dL): 143 (127,162) ApoB (mg/dL): 100 (86,113) **NASH cirrhotic** (22) • **BMI:** 34.2 (29.9,36.3) • **Mean age (years): 60** (52,64) • **Gender (males): 8** • **Values:** ApoA1 (mg/dL): 126 (117,148) ApoB (mg/dL): 86 (77,119) **Control** (10) • **BMI:** 25.6 (23.4,27.5) • **Mean age (years):** 32 (25,37) • **Gender (males):** 6 • **Values:** ApoA1 (mg/dL): n.a. ApoB (mg/dL): 91 (86,95)	No significant differences in apolipoproteins profile between groups

Li R et al / 2023 / China	Observational retrospective study	• **Population**: Subjects with newly diagnosed T2DM • **Total subjects:** 731 **NAFLD diagnosis:** US **NAFLD** (371) • **BMI:** 27.28±4.82 • **Mean age (years):** 51.45±15.86 • **Gender (males):** 242 • **Values:** ApoA1 (mmol/L): 1.12± 0.18 ApoB (mmol/L): 1.09± 0.22 ApoB/A1: 1.00±0.27 **Non-NAFLD** (360) • **BMI:** 23.65±4.20 • **Mean age (years):** 57.21±16.83 • **Gender (males):** 212 • **Values:** ApoA1 (mmol/L): 1.16± 0.18 ApoB (mmol/L): 0.98± 0.23 ApoB/A1: 0.87±0.22 AUC for ApoB/A1: 0.663 (0.623-0.702)	Significant differences in apolipoproteins profile between groups
Mehta A et al / 2023 / USA	Cross-sectional study	• **Population**: Participants recruited from the Virginia Com- monwealth University Health System NAFLD clinic • **Total subjects:** 151 **NAFLD diagnosis:** Liver biopsy **NAFL** (65) • **BMI:** 32.0 (28.9, 35.3) • **Mean age (years):** 52.2 (47.0, 62.2) • **Gender (males):** 40 • **Values:** ApoB (mg/dL): 92 (71.5,110) ApoA1 (mg/dL): 141 (122.5,162.5) ApoB/ApoA1 ratio: 0.630 (0.508,0.825) **NASH** (86) • **BMI:** 33.1 (29.1, 37.6) • **Mean age (years):** 56.0 (48.7, 62.1) • **Gender (males):** 61 • **Values:** ApoB (mg/dL): 99.5 (82 ,121) ApoA1 (mg/dL): 137 (118,155.3) ApoB/ApoA ratio: 0.730 (0.580,0.973)	Significant higher levels of ApoB in NASH group

Theofilis P et al / 2023 / Greece	Cross-sectional study	• **Population**: People with new onset hypertension • **Total subjects:** 281 • **NAFLD diagnosis:** Imaging techniques, histology, or blood biomarkers/scores **MAFLD** (75) • **BMI>30 (%):** 63 • **Mean age (years):** 49.9±10.5 • **Gender (males):** 56 • **Values:** ApoA1 (mg/dL): 138 (120,155) ApoB (mg/dL): 128 (30) ApoE (mg/dL): 44 (38,53) **Non-MAFLD** (206) • **BMI>30 (%):** 45.3 • **Mean age (years):** 49.5±10.8 • **Gender (males):** 97 • **Values:** ApoA1 (mg/dL): 147 (132,165) ApoB (mg/dL): 108 (26) ApoE (mg/dL): 38 (32,44)	Significant higher levels of ApoB and ApoE in MAFLD group, while ApoA1 was significantly higher in non-MAFLD group
Chen J et al / 2024 / China	Prospective cohort study	• **Population**: Obese Chinese hospitalized between 2017- 20 undergoing bariatric surgery • **Total subjects:** 250 • **NAFLD diagnosis:** Liver biopsy **NAFLD total** (196) • **BMI:** 39.27 (34.71,44.86) • **Mean age (years):** 30 (24.5,36) • **Gender (males):** 95 • **Values:** ApoB (g/L): 1.06 ±0.22 ApoA (g/L): 1.23 (1.1,1.35) **Simple steatosis** (55) • **BMI:** 37.95 (33.1,41.82) • **Mean age (years):** 30.5 (25.25,32.25) • **Gender (males):** 27 • **Values:** ApoB (g/L): 1.01 ±0.21 ApoA (g/L): 1.22 (1.03,1.35) **NASH** (75) • **BMI:** 37.95 (33.1,41.82) • **Mean age (years):** 30 (23,35) • **Gender (males):** 31 • **Values:** ApoB (g/L): 1.08 ±0.23	No significant changes in apolipoproteins profile between study groups

		ApoA (g/L): 1.23 (1.12,1.33) **Control** (44) • **BMI:** 34.15 (31.8,38.5) • **Mean age (years):** 30 (25,39) • **Gender (males):** 12 • **Values:** ApoB (g/L): 0.92 ±0.2 ApoA (g/L): 1.32 (1.21,1.5)	
Chen X et al / 2024/ China		• **Population**: NAFLD patients • **Total subjects:** 112 • **NAFLD diagnosis:** US **NAFLD** (62) • **BMI:**26.15 (24.9,27.73) • **Mean age (years):** 43.73±14.63 • **Gender (males):** 42 • **Values:** ApoA1 (g/L): 1.34 (1.24,1.44) ApoB (g/L): 1.04 (0.89,1.17) **Control** (50) • **BMI:** 25.3 (23.68,26.95) • **Mean age (years):** 49.48±14.72 • **Gender (males):** 28 • **Values:** ApoA1 (g/L): 1.31 (1.19,1.46) ApoB (g/L): 0.89 (0.73,1.06)	Significant higher levels of ApoB in NAFLD group

Abbreviation: NAFLD – Non Alcoholic Liver Disease, NASH- Non Alcoholic Steatohepatitis, BMI- Body Mass Index, Apo- Apolipoprotein ,IHTG- intrahepatic triglyceride, MRS- Magnetic resonance spectroscopy, NASS- Simple Liver Steatosis, US- Ultrasound, AUC- Area under the curve, HTG- Hypertriglyceridemia, TG- Triglyceride, VLDL- very low density lipoprotein, MRI- magnet resonance imaging, CIMT- carotid intima media thickness, PGDM- previous gestational diabetes mellitus, IHCL- intrahepatocellular lipid, SS- simple steatosis, T2DM- type 2 diabetes mellitus, HDL– high density lipoprotein, MS- metabolic syndrome, AFLD- alcoholic fatty liver disease, FLI- fatty liver index, CVD- cardiovascular disease, UDCA- ursodeoxycholic acid, Hep- hepatitis, MAFLD- metabolic dysfunction associated fatty liver disease, PostPO- pancreatoduodenectomy, MRI-PDFF- protein density fat fraction, n.a.- not available

Supplementary Table 2. The Newcastle-Ottawa Scale (NOS) for assessing the quality of cross-sectional studies.

Study	Selection (Maximum 5 stars)				Comparability (Maximum 2 stars)	Outcome (Maximum 3 stars)		Score (Total maximum 10 stars)
	Sample representativeness	**Sample size**	**Non-Respondents**	**Ascertainment of the exposure (risk factor)**	**Comparability**	**Assessment of the outcome**	**Statistical test**	
Park et al 2004	-	-	-	**	**	**	*	7
Poynard et al 2006	-	-	-	**	* *	**	*	7
Ratziu et al 2006	-	-	-	**	* *	**	*	7
Demirag et al 2007	-	*	-	**	*	**	*	7
Fabbrini et al 2007	-	-	-	**	**	**	*	7
Gambino et al 2007	-	-	-	**	**	**	*	7
Park et al 2007	-	*	-	**	**	*	*	7
Moustafa et al 2009	-	-	-	**	**	**	*	7
Lucero et al 2010	-	*	-	**	*	**	*	7
Tanaka et al 2011	-	-	-	**	*	*	*	5
Choe et al 2012	*	-	-	*	**	**	*	7
Miksztowicz et al 2012	-	*	-	**	*	**	*	7
Forbes et al 2013	-	-	-	**	*	**	*	6
Miller et al 2014	-	-	-	**	**	**	*	7
Niu et al 2014	-	*	-	**	**	**	*	8
Bril et al 2015	*	-	-	**	*	**	*	7
Chunming et al 2015	-	-	-	**	*	**	*	6
Ozel et al 2015	-	-	-	**	**	**	*	7
Garcia et al 2015	-	-	-	**	*	**	*	6
Onat et al 2015	*	*	-	**	*	**	*	8
Privitera et al 2015	-	-	-	**	*	**	*	6
Siddiqui et al 2015	-	*	-	**	* *	**	*	8
Shukla et al 2015	-	-	-	**	*	**	*	6
Wang et al 2016	*	*	-	**	*	**	*	8
Mladenovic et al 2017	-	-	-	**	*	**	*	6
Nass et al 2017	*	-	-	**	*	**	*	7

Eremic-Kojic et al 2018	-	-	-	**	**	**	*	7
Fadaei et al 2018	-	-	-	**	* *	**	*	7
McCullough et al 2019	-	-	-	**	*	**	*	6
Ren et al 2019	*	-	-	**	**	**	*	8
Trojak et al 2019	-	-	-	**	*	**	*	6
Van den Berg et al 2019	*	-	-	**	**	**	*	8
Zhang et al 2019	-	*	-	**	**	**	*	8
Huang et al 2020	*	-	-	**	*	**	*	7
Patel et al 2020	-	-	-	**	-	**	*	5
Zhang et al 2020	-	-	-	**	* *	**	*	7
Zong et al 2020	-	*	-	**	**	**	*	8
Esteve-Luque et al 2021	-	*	-	**	*	**	*	7
Hou X et al 2021	-	-	-	**	**	**	*	7
Wu et al 2021	*	-	-	**	*	**	*	7
Wu et al 2021	*	-	-	**	**	**	*	7
Bril et al 2022	*	-	-	*	**	**	*	8
Hu et al 2022	-	*	-	**	*	**	*	7
Ismaiel et al 2022	-	*	-	**	*	**	*	7
Lawitz et al 2022	-	-	-	**	*	**	*	6
Li et al 2022	-	*	-	**	*	**	*	7
Ye et al 2022	*	*	-	**	*	**	*	8
Zhao et al 2022	*	-	-	**	**	**	*	8
Björnson et al 2023	*	-	-	**	*	**	*	7
Dandan et al 2023	-	-	-	**	* *	**	*	7
Li et al 2023	-	*	-	**	*	**	*	7
Mehta et al 2023	-	-	-	**	**	**	*	7
Theofilis et al 2023	-	-	-	**	*	**	*	6
Chen et al 2024	-	-	-	**	*	**	*	6
Chen et al 2024	-	-	-	**	**	**	*	7