

Supplementary Material 2. Baseline characteristics of the included studies

Author (yr)	Age (range)	Age (mean)	Male (%)	Diabetic status	Liver disease status (NAFLD, NASH)	Experimental group		Control group		Outcome*	Duration (wk)		
						Treatment	N1	BMI (kg/m ²)	Treatment			N2	BMI (kg/m ²)
Idilman et al. (2008)	>18	47.2	59.5	T2DM	NASH	TZD vs. placebo Rosiglitazone 8 mg/day +LSM [†]	25	31.2±3.6	LSM [†]	25	32.2±5.1	NAS, fibrosis stage, ALT (IU/mL), AST (IU/mL), BMI (kg/m ²), WC (cm), FPG (mg/dL), HOMA-IR, T-Chol (mg/dL), TG (mg/dL)	48
Kuchay et al. (2020)	>20	47.4	70.3	T2DM	NAFLD	GLP-1RA vs. placebo Dulaglutide 1.5 mg/week usual care [‡] +LSM [†]	27	29.6±3.6	Usual care [‡] +LSM [†]	25	29.9±3.9	Liver fat contents (by CAP), ALT (U/L), AST (U/L), BMI (kg/m ²), HbA1c (mmol/mol, %), FPG (mmol/L), LDL-C (mmol/L), TG (mmol/L)	24
Zhang et al. (2020)	18–70	50.9	46.7	T2DM	NAFLD	GLP-1RA vs. TZD Liraglutide 1.2 mg/day +LSM [†]	30	27.6±5.2	Placebo Pioglitazone 30 mg/day +LSM [†]	30	27.1±3.8	Liver fat contents (by ¹ H-MRS), ALT (natural logarithm), AST (natural logarithm), BMI (kg/m ²), WC (cm), HbA1c (%), FPG (mmol/L), HOMA-IR, T-Chol (mmol/L), LDL-C (mmol/L), TG (mmol/L)	24
Omer et al. (2010)	NA	48.9	54.7	T2DM or impaired glucose tolerance	NASH	TZD vs. placebo Rosiglitazone 4 mg/day +LSM [†] +Metformin 1,700 mg/day	22	32.5±7.0	LSM [†] +Metformin 1,700 mg/day	22	30.8±6.6	ALT (U/L), AST (U/L), BMI (kg/m ²), WC (cm), HbA1c (%), FPG (mg/dL), HOMA-IR	48
Chehrehghoşa et al. (2021)	20–65	51.6	43.4	T2DM	NAFLD	TZD vs. placebo Pioglitazone 30 mg/day +LSM [†]	34	29.4±3.7	Placebo +LSM [†]	37	30.2±4.4	Liver fat contents (by CAP), BMI (kg/m ²), HbA1c (%), FPG (mg/dL), HOMA-IR, T-Chol (mmol/L), LDL-C (mg/dL), TG (mg/dL)	24
Kakazu et al. (2013)	≥20	57.1	25.0	T2DM or impaired glucose tolerance	NASH	TZD vs. placebo Pioglitazone 15 mg/day +diet	12	28.2±4.4	Diet	12	26.7±3.1	ALT (IU/L), AST (IU/L), BMI (kg/m ²), HbA1c (%), FPG (mg/dL), HOMA-IR, LDL-C (mg/dL), TG (mg/dL)	96
Guo et al. (2020)	30–60	52.6	59.3	T2DM	NAFLD	GLP-1RA vs. placebo Liraglutide 1.8 mg/day LSM [†] +Metformin 2,000 mg/day	31	29.2±4.2	Placebo +LSM [†] +Metformin 2,000 mg/day	30	28.6±3.7	Liver fat contents (by ¹ H-MRS), ALT (U/L), AST (U/L), BMI (kg/m ²), WC (cm), HbA1c (%), FPG (mmol/L), HOMA-IR, T-Chol (mmol/L), LDL-C (mmol/L), TG (mmol/L)	26
Armstrong et al. (2016) [†]	18–70	51.0	59.6	With or without T2DM	NASH	GLP-1RA vs. placebo Liraglutide 1.8 mg/day +LSM [†]	23	34.2±4.7	Placebo +LSM [†]	22	37.7±6.2	NAS, fibrosis stage, NASH resolution, ALT (U/L), AST (U/L), BMI (kg/m ²), WC (cm), HbA1c (mmol/mol, %), FPG (mg/dL), HOMA-IR, T-Chol (mmol/L), LDL-C (mmol/L)	48

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Author (yr)	Age (range)	Age (mean)	Male (%)	Diabetic status	Liver disease status (NAFLD, NASH)	Experimental group		Control group		Outcome*	Duration (wk)		
						Treatment	N1	BMI (kg/m ²)	Treatment			N2	BMI (kg/m ²)
Cusi et al. (2016)	18–70	50.5	70.3	T2DM or prediabetes	NASH	TZD vs. placebo	50	34.3±4.8	Placebo +diet	51	34.5±4.8	Liver fat contents (by ¹ H-MRS), NAS, fibrosis stage, NASH resolution, ALT (U/L), AST (U/L), BMI (kg/m ²), FPG (mg/dL, mmol/L), T-Chol (mg/dL, mmol/L), LDL-C (mg/dL, mmol/L), TG (mg/dL, mmol/L)	72
Vedtofte et al. (2020) ¹	NA	36.9	0	Non-diabetic with prior gestational diabetes mellitus (pGDM)	NAFLD	GLP-1RA vs. placebo	10	32.1 (27.4;36.3)	Placebo	8	30.6 (28.4;33.0)	Liver fat contents (by CAP), ALT (U/L), AST (U/L), BMI (kg/m ²), WC (cm), HbA1c (mmol/mol, %), FPG (mmol/L), HOMA-IR, T-Chol (mmol/L), LDL-C (mmol/L), TG (mmol/L)	48
Sanyal et al. (2010)	≥18	46.3	40.0	Non-diabetic	NASH	TZD vs. placebo	70	34.0±6.0	Placebo +LSM ¹	72	35.0±7.0	NAS, fibrosis stage, resolution of NAS, ALT (U/L), AST (U/L), BMI (kg/m ²), WC (cm), FPG (mg/dL), HOMA-IR, TC (mg/dL)	96
Belfort et al. (2006)	21–70	51.0	44.7	T2DM or impaired glucose tolerance	NASH	TZD vs. placebo	26	33.5±4.9	Placebo +diet	21	32.9±4.4	Liver fat contents (by ¹ H-MRS), fibrosis stage, ALT (U/L), AST (U/L), BMI (kg/m ²), HbA1c (%), FPG (mg/dL), TC (mg/dL), LDL-C (mg/dL), TG (mg/dL)	24
Newsome et al. (2021)	18–75	55.0	39.3	With or without T2DM	NASH	Semaoglutide 0.1 mg/day+LSM ¹ Semaoglutide 0.2 mg/day+LSM ¹ Semaoglutide 0.4 mg/day+LSM ¹	80 78 82	36.1±6.4 35.6±6.1 35.2±6.6	Placebo +LSM ¹	80	36.1±6.6	Fibrosis stage, resolution of NASH, ALT (U/L), AST (U/L), HbA1c (%), TC (mg/dL)	72
Aithal et al. (2008)	18–70	53.5	61.0	Non-diabetic	NASH	TZD vs. placebo	31	29.8±3.0	Placebo +LSM ¹	30	30.8±4.1	Fibrosis (stage), ALT (U/L), BMI (kg/m ²), HbA1c (%), FPG (mmol/L), HOMA-IR, T-Chol (mmol/L), LDL-C (mmol/L), TG (mmol/L)	48
Bril et al. (2018) ²²	18–70	47.0	69.0	Non-diabetic	NASH	TZD vs. placebo	21	34.4±4.1	Placebo +LSM ¹	17	34.4±4.1	Fibrosis (stage), ALT (U/L), AST (U/L), BMI (kg/m ²), HbA1c (%), FPG (mg/mL)	72
Bril et al. (2018) ²²	18–70	54.0	71.0	T2DM	NASH	TZD vs. placebo	20	34.4±5.4	Placebo +LSM ¹	25	34.4±5.4	Fibrosis (stage), ALT (U/L), AST (U/L), BMI (kg/m ²), HbA1c (%), FPG (mg/mL)	72

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Author (yr)	Age (range)	Age (mean)	Male (%)	Diabetic status	Liver disease status (NAFLD, NASH)	Drug class		Experimental group		Control group		Outcome*	Duration (wk)	
						TZD vs. placebo	GLP-1RA vs. placebo	Treatment	N1	Treatment	N2			BMI (kg/m ²)
Bril et al. (2019)	18-70	59.0	88.0	T2DM	NASH	TZD vs. placebo	Pioglitazone 45 mg/day +LSM [†] +vitamin E	29	35.2±4.3	LSM [†] +vitamin E	33	33.6±4.0	Liver fat contents (by ¹ H-MRS), NAS, fibrosis (stage), NASH resolution, BMI (kg/m ²), HbA1c (%), FPG (mg/dL), T-Chol (mg/dL), LDL-C (mg/dL), TG (mg/dL)	72
Ratzl et al. (2008)	18-75	53.6	59.0	With or without T2DM	NASH	TZD vs. placebo	Rosiglitazone 4 mg/day +LSM [†]	32	31.5±6.0	Placebo +LSM [†]	31	30.5±4.4	NAS, fibrosis (stage), HbA1c (%), FPG (mmol/L), HOMA-IR, TC (mmol/L), LDL-C (mmol/L), TG (mmol/L)	48
Balas et al. (2007)	NA	49.7	46.0	T2DM or impaired glucose tolerance	NASH	TZD vs. placebo	Pioglitazone 30 mg/day +diet	21	33.6±1.2	Placebo +diet	14	33.9±1.2	BMI (kg/m ²), HbA1c (%), FPG (mg/dL)	24
Khoor et al. (2019)	21-65	41.1	93.0	Non-diabetic	NAFLD	GLP-1RA vs. placebo	Liraglutide 3 mg/day	15	34.3±3.9	LSM [†]	15	32.2±3.2	ALT (U/L), AST (U/L), BMI (kg/m ²), WC (cm), FPG (mmol/L), HOMA-IR	26
Khoor et al. (2017)	21-65	41.4	91.7	Non-diabetic	NAFLD	GLP-1RA vs. placebo	Liraglutide 3 mg/day	12	33.9±3.7	LSM [†]	12	32.2±3.3	ALT (U/L), AST (U/L), BMI (kg/m ²), WC (cm), FPG (mmol/L), HOMA-IR	26
Yaghoobi et al. (2017)	30-55	37.0	NA	Non-diabetic	NAFLD	TZD vs. placebo	Pioglitazone 30 mg/day +LSM [†]	30	26.0±3.0	LSM [†]	30	27.0±4.0	ALT (mg/dL), AST (mg/dL), BMI (kg/m ²), FPG (mg/dL), T-Chol (mg/dL), TG (mg/dL)	12
Anushiravani et al. (2019)	18-65	47.0	51.3	Non-diabetic	NAFLD	TZD vs. placebo	Pioglitazone 15 mg/day +LSM [†]	30	25.1±3.7	LSM [†]	30	26.1±3.1	ALT (U/mL), AST (U/mL), BMI (kg/m ²), WC (cm), FPG (mg/dL), T-Chol (mg/dL), LDL-C (mg/dL), TG (mg/dL)	12
Armstrong et al. (2016) ^{§,}	18-70	57.5	64.0	T2DM or impaired glucose tolerance or normal glucose tolerance	NASH	GLP-1RA vs. placebo	Liraglutide 1.8 mg/day	7	34.0 (30.7, 35.9)	Placebo	7	36.5 (29.3, 40.0)	ALT (IU/L), AST (IU/L), BMI (kg/m ²), WC (cm), HbA1c (%), FPG (mmol/L), T-Chol (mmol/L), LDL-C (mmol/L), TG (mmol/L)	12
Yan et al. (2015)	18-65	51.6	53.0	T2DM or impaired glucose tolerance	NAFLD	TZD vs. placebo	Pioglitazone 15 mg/day +LSM [†]	47	27.47±3.74	LSM [†]	53	27.3±2.8	Liver fat contents (by ¹ H-MRS), ALT (IU/mL), AST (IU/mL), BMI (kg/m ²), WC (cm), HbA1c (%), FPG (mmol/L), HOMA-IR, T-Chol (mmol/L), LDL-C (mmol/L), TG (mmol/L)	16
Corey et al. (2015)	≥18	46.3	40.0	Non-diabetic	NASH	TZD vs. placebo	Pioglitazone 30 mg/day	80	34.0±6.0	Placebo	83	35.0±7.0	T-Chol (mg/dL)	96

BMI data were expressed as mean±standard deviation or median (interquartile range).

ALT, alanine aminotransferase; AST, aspartate aminotransferase; BMI, body mass index; CAP, controlled attenuation parameter; FPG, fasting plasma glucose; GLP-1RA, glucagon-like peptide-1 receptor agonist; ¹H-MRS, proton magnetic resonance spectroscopy; HOMA-IR, homeostasis model assessment of insulin resistance; LDL-C, low-density lipoprotein cholesterol; LSM, lifestyle modification; NA, Not addressed; NAFLD, nonalcoholic fatty liver disease; NAS, nonalcoholic fatty liver activity score; NASH, nonalcoholic steatohepatitis;

T2DM, Type 2 diabetes mellitus; T-Chol, total cholesterol; TG, triglyceride; TZD, thiazolidinedione; WC, waist circumference.

*Not extractable data are represented in italics.

[†]Life style modification means the proper management of diet and guide to exercise.

[‡]Usual care indicates antidiabetic treatments used for T2DM like metformin, sulfonylurea, and insulin which is not the intervention drug. The same expression with the original article is documented in this table.

[§]These are different articles.

^{||}There are no mentions with respect to any lifestyle modification.

^{**}These are subgroups from the same articles.