

Supplementary table 1. Associations between sleep variables and lipoprotein levels in entire study population

Table 1a. OSA measures vs. lipis								
	AHI	AI	OAI	Lowest SpO ₂	Mean SpO ₂	Spont ArI	Resp ArI	Total ArI
TG	0.083 (0.08)	0.051 (0.29)	0.127* (0.01)	-0.053 (0.27)	-0.043 (0.36)	0.064 (0.18)	-0.005 (0.92)	0.128* (0.01)
TChol	-0.005 (0.92)	-0.015 (0.76)	0.055 (0.27)	-0.024 (0.62)	0.009 (0.85)	0.063 (0.18)	-0.043 (0.38)	0.041 (0.41)
HDL	-0.044 (0.36)	-0.02 (0.69)	-0.015 (0.76)	-0.093 (0.054)	0.034 (0.48)	0.023 (0.62)	0.072 (0.14)	0.02 (0.69)
LDL	0.01 (0.83)	-0.002 (0.98)	0.027 (0.59)	0.028 (0.56)	0.005 (0.91)	0.049 (0.30)	-0.083 (0.09)	0.015 (0.77)
LDL:HDL ratio	0.037 (0.44)	0.029 (0.55)	0.031 (0.54)	0.074 (0.13)	-0.027 (0.57)	-0.003 (0.95)	-0.100* (0.04)	-0.015 (0.76)
TChol HDL ratio	0.056 (0.24)	0.043 (0.37)	0.057 (0.26)	0.053 (0.27)	-0.03 (0.53)	0.012 (0.81)	-0.083 (0.09)	0.013 (0.79)
TG:HDL ratio	0.087 (0.068)	0.053 (0.27)	0.100* (0.04)	-0.004 (0.93)	-0.042 (0.38)	0.044 (0.35)	-0.032 (0.51)	0.097 (0.053)

Table 1b. Sleep architecture vs. lipids									
	Sleep Efficiency	Sleep latency	REM latency	TST	WASO	N1 %TST	N2 %TST	N3 %TST	REM %TST
TG	-0.047 (0.32)	0.071 (0.14)	0.039 (0.41)	-0.034 (0.48)	0.024 (0.61)	-0.068 (0.15)	0.012 (0.81)	0.021 (0.65)	-0.036 (0.44)
TChol	-0.059 (0.21)	0.035 (0.47)	-0.075 (0.12)	-0.048 (0.32)	0.030 (0.53)	-0.056 (0.23)	-0.05 (0.30)	0.065 (0.17)	-0.016 (0.74)
HDL	-0.036 (0.45)	0.015 (0.75)	-0.048 (0.31)	-0.110* (0.02)	-0.008 (0.87)	0.055 (0.25)	-0.012 (0.80)	0.005 (0.92)	0.015 (0.75)
LDL	-0.010 (0.84)	-0.006 (0.91)	-0.063 (0.18)	0.027 (0.58)	0.016 (0.74)	-0.067 (0.16)	-0.049 (0.30)	0.079 (0.09)	-0.019 (0.68)
LDL:HDL ratio	0.044 (0.36)	-0.030 (0.79)	-0.013 (0.79)	0.110* (0.02)	0.007 (0.89)	-0.090 (0.06)	-0.021 (0.67)	0.054 (0.26)	-0.028 (0.56)
TChol HDL ratio	-0.020 (0.67)	0.046 (0.33)	0.052 (0.28)	0.013 (0.79)	0.025 (0.59)	-0.067 (0.16)	0.011 (0.82)	0.013 (0.79)	-0.032 (0.50)
TG:HDL ratio	0.023 (0.63)	-0.010 (0.83)	-0.001 (0.98)	0.090 (0.06)	0.017 (0.73)	-0.083 (0.08)	-0.021 (0.66)	0.047 (0.33)	-0.025 (0.61)

Table legend: Numbers represent Spearman's rho correlation coefficients (p-values). *= $p < 0.05$, **= $p < 0.01$. Numbers in bold represent significant correlations.

AHI=apnea-hypopnea index; AI=apnea index; OAI=obstructive apnea index; SpO₂=oxyhemoglobin saturation; ArI=arousal index; spont=spontaneous; resp=respiratory; LFL =low-density lipoprotein; HDL= high-density lipoprotein; Tchol=total cholesterol; TG=triglycerides. REM = Rapid eye movement (sleep stage); N1=stage 1 sleep; N2=stage 2 sleep; N3=stage 3 sleep/slow wave sleep; TST=total sleep time (minutes); N(1-3) or REM %TST = % of sleep spent in stage N(1-3) or REM.

Supplementary table 2. Comparison of lipoprotein levels across non-obese and obese AHI groups

	AHI 0-1/hour TST – No OSA		AHI 1-5/hour TST – Mild OSA		AHI >5/hour TST – Moderate-Severe OSA	
	Non-obese	Obese	Non-obese	Obese	Non-obese	Obese
Triglycerides†	67.1 ± 39.7	66.9 ± 37.2	70.1 ± 41.3	73.9 ± 37.2 <i>f</i>	70.2 ± 44.8	75.6 ± 34.0
Total Cholesterol	157.2 ± 27.2	157.6 ± 28.9	154.0 ± 30.1	157.5 ± 25.2	157.2 ± 22.2	162.4 ± 22.8
HDL Cholesterol	50.9 ± 14.4	50.9 ± 11.7	49.1 ± 13.1	49.4 ± 10.6	51.4 ± 13.3	49.1 ± 11.5
LDL Cholesterol	92.9 ± 24.0	93.3 ± 23.9	90.6 ± 26.3	93.4 ± 21.3	91.9 ± 25.0	98.2 ± 19.6
LDL/HDL ratio	1.99 ± 0.83	1.93 ± 0.68†	1.98 ± 0.74	1.99 ± 0.68	1.94 ± 0.81	2.10 ± 0.58
TChol/HDL ratio	3.29 ± 1.00	3.23 ± 0.88†	3.30 ± 0.89	3.31 ± 0.81	3.25 ± 0.90	3.45 ± 0.74∠
TG/HDL ratio†	1.53 ± 1.36	1.50 ± 1.34	1.61 ± 1.17	1.62 ± 0.96	1.56 ± 1.28	1.72 ± 1.11

Table legend: Numbers represent mean +/- S.D. Numbers in bold are significantly different between non-obese and obese subjects within the same AHI group.

LDL=low-density lipoprotein; HDL= high-density lipoprotein; NOB=non-obese.

*= $p < 0.05$, **= $p < 0.01$, and *f* = $0.05 < p < 0.1$ for T-test/Mann Whitney comparisons between NOB and obese within an AHI group

Supplementary table 3. HOMA-IR quartile comparisons:

	AHI 0-1/hour TST – No OSA				AHI 1-5/hour TST – Mild OSA				AHI >5/hour TST – Moderate-Severe OSA			
	Non-obese		Obese		Non-obese		Obese		Non-obese		Obese	
HOMA-IR quartile	1	4	1	4	1	4	1	4	1	4	1	4
N	47	39	18	16	27	25	11	17	8	8	8	11
Age	7.0± 0.1	7.3± 1.1f‡	7.3 ± 1.2	8.2 ± 1.9	7.0 ± 0.87	7.3 ± 1.4‡	7.2 ± 1.5	8.2 ± 1.7f‡	7.0 ± 1.5	7.6 ± 1.7	7.4 ± 1.2	7.5 ± 1.7
BMI	16.9± 2.6	16.8± 3.1‡	21.0± 4.0	25.6± 6.8*	16.7 ± 1.9	16.5 ± 2.2‡	21.6 ± 2.9	28.3 ± 7.9**‡	16.9 ± 5.6	20.8 ± 6.7‡	27.7 ± 9.4	28.6 ± 6.8‡
BMI Z-score	0.41± 0.8	0.04± 1.3‡	2.2 ± 0.4	2.4 ± 0.6‡	0.36 ± 1.1	0.13 ± 1.4‡	2.0 ± 0.3	2.5 ± 0.3**	-1.1 ± 3.0	0.78 ± 0.8*‡	2.4 ± 0.3	2.6 ± 0.7‡
OSA Measures:												
AHI	0.44± 0.30	0.38± 0.31	0.39± 0.31	0.38± 0.31	2.0 ± 0.89	1.8 ± 0.91	1.7 ± 0.9	2.5 ± 0.9*	18.3± 16.4	8.2 ± 1.7‡	13.8± 10.9	17.5 ± 21.5‡
AI	0.26± 0.25	0.26± 0.27	0.27± 0.27	0.10± 0.15*‡	0.92± 0.84	0.84± 0.47	0.66± 0.31	0.58± 0.39	3.5 ± 3.7	1.7 ± 1.4‡	1.2± 0.8	10.6± 22.3‡
OAI	0.07± 0.13	0.11± 0.21‡	0.10± 0.13	0.04± 0.14‡	0.17 ± 0.3	0.25 ± 0.3	0.29± 0.19‡	0.31± 0.34‡	4.4 ± 7.4	0.9 ± 0.8‡	1.9± 3.5	3.2 ± 4.6‡
Spont ArI	7.2± 3.3	8.9± 5.7**‡	8.6± 4.5	10.2± 5.3‡	7.5± 5.8	10.9± 10.1‡	8.3± 6.0	11.7± 9.9	7.6± 7.4	10.0± 8.1	11.4± 5.4	9.6± 6.4
Resp ArI	0.96± 2.9	0.57± 0.87‡	0.91± 1.8	0.61± 1.0‡	2.4 ± 2.9	2.2 ± 2.6‡	1.44± 1.35‡	2.62± 2.62‡	12.9± 10.5	8.9 ± 6.2‡	8.1± 5.2	25.7± 14.1f‡ P=0.053
Total ArI	8.1± 3.5	9.7± 6.1**‡	11.7± 7.7	10.3± 6.3	8.3 ± 4.4	12.3± 8.2f p=0.051	9.9 ± 5.6‡	15.3± 12.6‡	17.5± 11.9	19.0 ± 10.1	20.1± 6.5	31.9± 12.4
SpO2 nadir %	93.3± 2.9	91.1± 15.7‡	93.9± 3.6	92.4± 3.7‡	92.0 ± 3.3	90.5 ± 5.8‡	90.0 ± 4.6	90.0 ± 3.2‡	85.4± 14.0	87.1± 10.0‡	80.3± 9.0	76.4 ± 15.4
Mean SpO2	97.5± 0.89	97.6 ± 0.60‡	97.9± 0.66	97.4± 1.2‡	97.1 ± 1.3	97.2 ± 1.6‡	96.4 ± 2.4	96.2 ± 2.0‡	95.5 ± 3.1	95.7± 2.1‡	95.5± 3.3	95.6 ± 2.8‡
Sleep pressure	0.02± 0.06	0.00± 0.01‡	0.03± 0.07	0.02± 0.04‡	0.12± 0.19	0.08 ± 0.12	0.13± 0.24‡	0.09 ± 0.02‡		QNS		QNS
Sleep architecture measures:												
Sleep Efficiency	90.6± 6.4	86.7± 16.1‡	90.4± 5.2	109.7± 85.8‡	92.2± 5.9	93.4± 9.3	86.4± 7.7	89.8± 8.2	87.3± 12.0	87.4± 12.1‡	90.8± 6.0	89.1± 7.0
Sleep latency	20.0± 15.8	16.4± 11.6‡	14.3± 8.5	20.3±2 2.7‡	14.8± 15.1	22.2± 28.4‡	33.6± 29.4	13.5± 10.5f‡	19.9± 23.9	16.5± 13.4‡	17.4± 17.1	19.4± 19.2
REM latency	126.1± 55.3	147.4± 73.7‡	139.3 ±71.6	143.9± 45.0‡	131.3 ±52.1	156.0± 55.9	177.9 ±72.9	172.0± 55.9	164.5 ±102	128.8± 27.1‡	178.9± 77.7	129.2± 51.7
TST	464.8± 53.4	464.0± 83.0‡	476.8 ±36.9	447.2± 47.4f‡	478.0 ±49.8	468.1± 63.0	448.1 ±49.7	451.3± 43.6	438.5 ±71.9	413.8± 131‡	474.0± 43.5	429.2± 50.1
WASO	40.8± 31.9	49.3± 36.7‡	44.1± 25.4	48.7±3 7.7	33.9± 29.4	32.6± 25.0‡	43.9± 29.7	40.3± 42.8‡	44.1± 64.5	36.7± 26.8‡	33.3±2 0.7	31.5± 27.8‡
N1 %TST	6.1± 4.5	5.8± 7.3‡	5.8± 4.6	7.0± 6.3‡	5.8± 3.8	5.1± 3.4	5.6± 3.6	4.1± 2.6	6.8± 5.2	11.5± 9.7‡	11.2± 9.2	5.5± 2.5‡
N2 %TST	45.1± 7.3	47.2± 8.1	46.2± 7.8	46.5± 9.1	43.5± 8.6	45.0± 10.8	47.9± 5.0	49.2± 42.8	42.4± 4.5	46.2± 12.3	52.5± 9.4	47.6± 8.0
N3 %TST	28.5± 6.8	28.2± 9.3	19.3± 20.8	28.1± 9.3‡	29.6± 8.1	28.0± 13.8‡	28.0± 6.5	30.0± 9.0	29.1± 11.78	26.1± 11.84	18.5± 13.8	26.9±8. 2
REM %TST	20.2± 5.8	18.5± 5.5	28.3± 23.6	18.4± 4.9*‡	20.9± 4.1	22.0± 12.6‡	18.3± 4.3	16.6± 4.1	21.7± 8.0	16.1± 7.5	17.7± 4.7	19.7±6. 9‡

Table legend: Numbers represent mean +/- S.D. Numbers in bold are significantly different between HOMA-IR quartiles within subgroup.

‡ = Non-normal distribution – non-parametric testing.

HOMA-IR quartile 1 = HOMA-IR in lowest quartile for entire study population (HOMA-IR<0.91); HOMA-IR quartile 4 = highest HOMA-IR quartile for entire study population (HOMA-IR>2.33). BMI = body mass index (kg/m²); AHI=apnea-hypopnea index; AI=apnea index; OAI=obstructive apnea index; ArI=arousal index SpO₂=oxyhemoglobin saturation; ETCO₂=end-tidal CO₂; SpO₂=oxyhemoglobin saturation; Resp=respiratory; spont=spontaneous; QNS = insufficient subjects in subgroup (e.g. obese, AHI>5, quartile 1) with sleep pressure score documented to perform subgroup analysis. REM=rapid eye movement; TST=total sleep time (minutes); N(1-3) %TST= % of total sleep spent in stage N1, N2, N3 or REM.
*= $p < 0.05$, **= $p < 0.01$, and $f = p$ between 0.05 and 0.1 for comparisons between HOMA-IR quartiles (lowest vs. highest) within non-obese subjects or within obese subjects in each AHI group