

SUPPLEMENTARY DATA

Supplementary Table 1. Variables associated with glucose metabolism according to obesity and OSA status after adjusting for age, sex and BMI in subjects without medication for diabetes or dyslipidemia.

	Total			BMI < 25			BMI ≥ 25		
	AHI < 5	AHI ≥ 5	P-value	AHI < 5	AHI ≥ 5	P-value	AHI < 5	AHI ≥ 5	P-value
N	642	486		423	214		219	272	
FPG, mmol/L	5.26 ± 0.03	5.34 ± 0.03	0.050	5.14 ± 0.03	5.24 ± 0.04	0.038	5.42 ± 0.05	5.47 ± 0.05	0.461
2hPG, mmol/L	7.8 ± 0.1	8.16 ± 0.11	0.020	7.31 ± 0.11	7.64 ± 0.16	0.100	8.43 ± 0.18	8.82 ± 0.16	0.111
HbA1c*, %	5.57 (5.53-5.60)	5.63 (5.59-5.68)	0.023	5.52 (5.48-5.56)	5.6 (5.54-5.66)	0.032	5.63 (5.56-5.70)	5.69 (5.63-5.76)	0.220
F-insulin*, uIU/mL	7.65 (7.44-7.88)	8.19 (7.92-8.48)	0.004	6.89 (6.65-7.14)	7.03 (6.68-7.40)	0.533	8.72 (8.31-9.16)	9.79 (9.36-10.23)	0.001
2h-insulin*, uIU/mL	37.14 (35.09-39.30)	43.73 (40.9-46.75)	<.001	32.04 (29.97-34.26)	36.1 (32.76-39.79)	0.054	44.67 (40.45-49.33)	55.01 (50.24-60.24)	0.003
HOMA-IR*	1.77 (1.72-1.83)	1.93 (1.86-2.00)	0.001	1.56 (1.50-1.62)	1.63 (1.54-1.72)	0.259	2.08 (1.97-2.20)	2.36 (2.24-2.48)	0.001
HOMA-beta*	92.37 (89.33-95.52)	94.34 (90.7-98.12)	0.439	88.5 (84.95-92.19)	85.11 (80.25-90.27)	0.298	96.65 (91.33-102.28)	105.26 (99.95-110.84)	0.032

Data are presented as adjusted mean ± SE or geometric mean (95% CI)

*Statistical significance was estimated after logarithmic transformation

FPG, fasting plasma glucose; 2hPG, 2h glucose after 75g glucose loading; F-insulin, fasting insulin; 2h-insulin, 2h insulin after 75g glucose loading; HOMA-IR, homeostasis model of assessment-insulin resistance; HOMA-beta, homeostasis model of assessment-beta cell function; AHI, apnea hypnea index

SUPPLEMENTARY DATA

Supplementary Table 2. Association of AHI tertile and glucose metabolism in subjects with or without obesity after adjusting for age, sex and BMI.

	T1	Total		p for trend	BMI < 25			p for trend	BMI ≥ 25			p for trend
		T2	T3		T1	T2	T3		T1	T2	T3	
N	450	446	448		241	245	243		205	205	205	
median(IQR)	0.95(0.4-1.6)	4.4(3.3-5.8)	13.4(10.3-19.2)		0.5(0.3-1.0)	2.9(2.3-4.1)	10.9(7.8-16.1)		1.8(1.0-2.8)	6.3(4.9-8.0)	16.3(12.4-24.8)	
IFG only	<i>ref</i>	0.95 (0.53-1.71)	0.73 (0.37-1.45)	0.369	<i>ref</i>	0.86 (0.39-1.91)	0.59 (0.22-1.57)	0.290	<i>ref</i>	1.70 (0.72-4.04)	0.89 (0.34-2.30)	0.807
IGT only	<i>ref</i>	1.24 (0.84-1.83)	1.58 (1.02-2.44)	0.041	<i>ref</i>	1.30 (0.78-2.18)	1.32 (0.73-2.39)	0.365	<i>ref</i>	1.32 (0.72-2.42)	1.65 (0.89-3.08)	0.115
IFG and IGT	<i>ref</i>	1.32 (0.69-2.51)	2.71 (1.45-5.08)	0.002	<i>ref</i>	0.77 (0.26-2.28)	3.62 (1.39-9.43)	0.009	<i>ref</i>	1.90 (0.84-4.30)	2.13 (0.91-4.99)	0.083
DM	<i>ref</i>	1.15 (0.79-1.69)	1.88 (1.27-2.79)	0.002	<i>ref</i>	0.86 (0.50-1.48)	2.26 (1.32-3.87)	0.003	<i>ref</i>	1.78 (1.03-3.09)	1.50 (0.85-2.68)	0.165

SUPPLEMENTARY DATA

Supplementary Table 3. Association between OSA and abnormal glucose metabolism according to obesity status in subjects without medication for diabetes or dyslipidemia.

	Total	BMI<25	BMI≥25
IFG only (N=76/580)			
model 1	1.00 (0.59-1.68)	0.80 (0.36-1.77)	0.85 (0.40-1.77)
model 2	0.92 (0.54-1.57)	0.69 (0.30-1.57)	0.83 (0.39-1.76)
model 3	0.80 (0.46-1.39)	0.69 (0.30-1.59)	0.82 (0.38-1.76)
model 4	0.77 (0.44-1.34)	0.61 (0.26-1.42)	0.81 (0.38-1.75)
model 5	0.90 (0.48-1.70)	0.81 (0.31-2.14)	0.83 (0.34-2.04)
IGT only (N=234/738)			
model 1	1.41 (1.01-1.98)	1.04 (0.63-1.71)	1.34 (0.81-2.24)
model 2	1.40 (1.00-1.97)	1.03 (0.63-1.70)	1.33 (0.79-2.23)
model 3	1.12 (0.78-1.60)	0.95 (0.57-1.58)	1.27 (0.75-2.15)
model 4	1.09 (0.76-1.56)	0.87 (0.52-1.46)	1.26 (0.74-2.13)
model 5	1.35 (0.86-2.13)	1.00 (0.52-1.91)	1.66 (0.83-3.29)
IFG and IGT (N=84/588)			
model 1	2.93 (1.79-4.78)	3.45 (1.59-7.50)	1.69 (0.88-3.26)
model 2	2.58 (1.55-4.28)	3.43 (1.55-7.62)	1.34 (0.67-2.68)
model 3	1.99 (1.18-3.35)	3.08 (1.37-6.91)	1.27 (0.63-2.56)
model 4	2.08 (1.23-3.50)	3.22 (1.43-7.25)	1.27 (0.63-2.56)
model 5	2.14 (1.12-4.08)	2.33 (0.92-5.90)	1.53 (0.60-3.89)
DM (N=230/734)			
model 1	2.45 (1.75-3.43)	2.5 (1.54-4.05)	1.71 (1.04-2.82)
model 2	2.33 (1.64-3.31)	2.47 (1.49-4.08)	1.57 (0.94-2.64)
model 3	1.95 (1.36-2.80)	2.44 (1.47-4.04)	1.44 (0.85-2.44)
model 4	1.95 (1.36-2.80)	2.28 (1.37-3.78)	1.51 (0.89-2.54)
model 5	1.70 (1.07-2.69)	2.51 (1.33-4.75)	1.02 (0.51-2.03)

Reference group: NGT, Data are presented as OR (95% CI)

Model 1: adjusted for age and sex

Model 2: adjusted for age, sex, alcohol consumption, smoking, exercise, the presence of hypertension, CVD and medication for dyslipidemia

SUPPLEMENTARY DATA

Model 3: adjusted for age, sex, alcohol consumption, smoking, exercise, the presence of hypertension, CVD, medication for dyslipidemia and BMI

Model 4: adjusted for age, sex, alcohol consumption, smoking, exercise, the presence of hypertension, CVD, medication for dyslipidemia and WC

Model 5: adjusted for age, sex, alcohol consumption, smoking, exercise, the presence of hypertension, CVD, medication for dyslipidemia and VFA (N=820, for subjects who underwent abdominal CT scan)

Supplementary Table 4. Association between the presence of excessive daytime sleepiness and abnormal glucose metabolism according to obesity status and OSA.

	BMI <25 (n=722)			BMI ≥25 (n=599)		
	OSA (-) (n=457)	OSA (+) (n=265)		OSA (-) (n=254)	OSA (+) (n=345)	
		EDS (-) (n=240)	EDS (+) (n=25)		EDS (-) (n=319)	EDS (+) (n=26)
IFG and/or IGT vs. NGT						
N	121/384	71/156	5/13	95/178	115/188	9/15
model	<i>ref</i>	1.2 (0.79-1.84)	1.19 (0.37-3.85)	<i>ref</i>	1.12 (0.71-1.75)	1.02 (0.34-3.09)
DM vs. NGT						
N	73/336	84/169	12/20	76/159	131/204	11/17
model	<i>ref</i>	1.96 (1.22-3.13)	5.78 (2.05-16.3)	<i>ref</i>	1.36 (0.85-2.19)	1.27 (0.39-4.08)

Model was adjusted for age, sex, alcohol drinking, smoking habit, exercise, presence of hypertension and CVD, and medication for dyslipidemia and the waist