

Current smoking and prediabetes in young and healthy adults

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BACKGROUND

Several studies have shown a strong relationship between smoking and type 2 diabetes. However, it is unclear whether smoking is related to changes in glucose homeostasis in young adults without prevalent type 2 diabetes and with a relatively short smoking history.

OBJECTIVE

To assess the association between smoking and prediabetes in a population based sample of young and healthy adults.

METHODS

Healthy individuals aged 25 to 40 are enrolled in 'Genetic and Phenotypic Determinants of Blood Pressure and Other Cardiovascular Risk Factors' (GAPP) Study. Smoking behavior was assessed by self-report. Pack years of smoking were calculated by multiplying the number of years smoked by the average number of cigarette packs smoked per day. Glycosylated hemoglobin (HbA1c) was assayed from fasting venous blood samples using high-performance liquid chromatography. Prediabetes was defined as HbA1c between 5.7 and 6.4%. Multivariable logistic regression analysis was performed to assess the independent relationship between smoking and prediabetes.

RESULTS

Of 857 participants, 231 (27%) had prediabetes. Baseline characteristics according to normoglycaemic and prediabetic participants are presented in Table 1.

In the age- and sex-adjusted logistic regression models using prediabetes as the outcome variable, current smoking was significantly associated with prediabetes (OR 1.79 (95%CI 1.24-2.59), $p=0.002$). This association remained significant after additional adjustment for body mass index, hypertension, alcohol consumption and cholesterol (OR 1.73 (95% CI 1.19-2.51) $p=0.004$). Compared to never and past smokers, current smoker with <5, 5-10, >10 pack years had an OR (95%CI) of 1.07 (0.53-2.13), 2.09 (1.08-4.07) and 2.22 (1.34-3.68), respectively (p for linear trend = 0.026).

Table 1 Baseline characteristics

	Normoglycaemic N = 626 (73%)	Prediabetes N = 231 (27%)	p
Sex (male)	276 (45)	135 (57)	0.0016
Age (y)	38 (32.8-41)	40 (34.4-41)	0.003
BMI (kg/m ²)	24.3 ± 3.7	25.4 ± 3.9	0.0001
Hypertension (%)	87 (14)	39 (16)	0.396
Current Smoker (%)	120 (19)	70 (29)	0.0003
Never Smoker (%)	341 (55)	121 (50)	0.308
Pack years	5.75 (3.9-14.63)	11.25 (5.6-18.0)	0.003

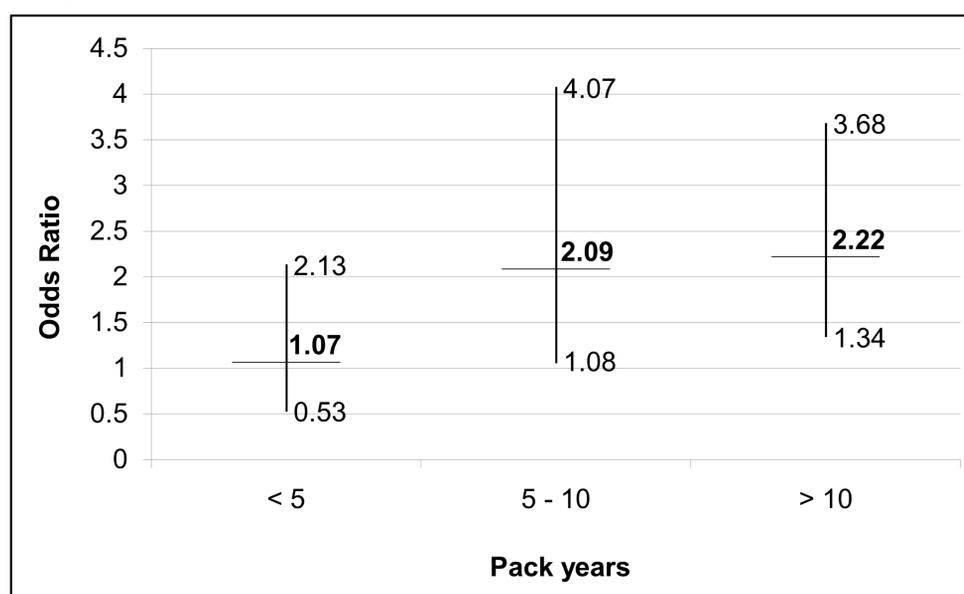
Data are means ± SD, medians (interquartile range) or number (percentage).

Table 2 Relationship of prediabetes and current smoking (multivariable logistic regression analysis)

	OR current smoking	95% CI	p
Model 1	1.79	1.24 – 2.59	0.002
Model 2	1.73	1.19 – 2.51	0.004

Model 1: sex and age adjusted; Model 2: adjusted for sex, age, BMI, hypertension, alcohol consumption, cholesterol. OR = Odds Ratio; CI = Confidence Interval

Figure 1 Pack years of smoking and risk of prediabetes



CONCLUSION

Accumulating as few as 5-10 pack years of smoking carries a more than 2-fold increased risk of having prediabetes in healthy young adults. Thus, our data reinforce the importance of smoking cessation in the general population.