Prevalence of prediabetes in healthy adults using HbA1c versus fasting plasma glucose The GAPP study

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Introduction

According to current guidelines, both hemoglobin A1c (HbA1c) (5.7-6.4%) and fasting plasma glucose (FPG, 5.6-6.9mmol/l) can be used as a screening tool for prediabetes. However, the correlation between HbA1c and FPG for the diagnosis of prediabetes or diabetes is not well studied, especially among young and healthy adults.

Methods

The Genetic and Phenotypic Determinants of Blood Pressure and Other Cardiovascular Risk Factors (GAPP) study is a population based cohort of healthy adults aged 25-41 years in the Principality of Liechtenstein. Main exclusion criteria are a prevalent cardiovascular disease, a prior diagnosis of diabetes mellitus and a body mass index (BMI) >35 kg/m2. FPG and HbA1c were assayed using a Roche Cobas 6000 (F.Hoffmann – La Roche, Switzerland) and high-performance liquid chromatography (Bio-Rad D-10), respectively. Prediabetes was defined according to the current guidelines as FPG between 5.6 and 6.9 mmol/l and/or HbA1c between 5.7 and 6.4%.

Results I

Of 1598 subjects who completed the baseline examination, 853 (53.4%) were women, mean age was 36.3 5.0 years and the mean BMI was 24.7 3.7 kg/m2. Obesity (BMI ≥30kg/m2) was present in 156 (9.8%) participants. The correlation coefficient between HbA1c and FPG was 0.26 (p<0.0001).

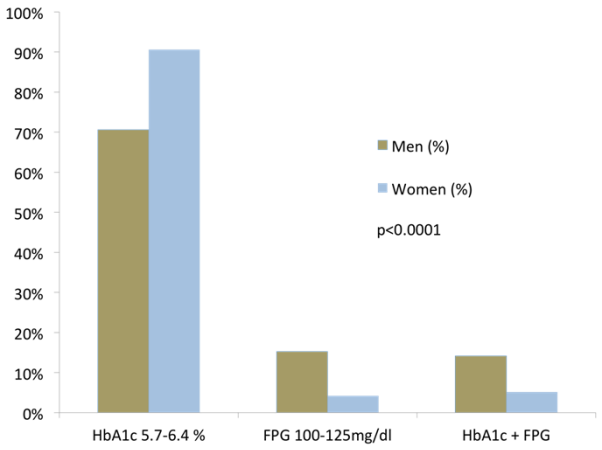
Results II

Overall, 482 (30.2%) had prediabetes (men 36.1%, women 25.0%, p<0.0001). A diagnosis of prediabetes was present in 383 (24.0%) by HbA1c criteria only, 50 (3.1%) by FPG criteria only and 49 (3.1%) by both criteria. This difference in prevalence was greater in women, in normotensive individuals and among non-obese participants (all p<0.0001) (Figure and Table).

Conclusion

The prevalence of prediabetes among young and healthy adults is highly dependent on the test used and is significantly higher using HbA1c criterion. This is especially true among women. If confirmed, our findings will have important implications for screening recommendation in the population.

Diagnosis of prediabetes – stratified by sex



Diagnosis of prediabetes according to different subgroups

	HbA1c 5.7-6.4 %	FPG 5.6 – 6.9 mmol/l	HbA1c + FPG	Total (≥1 positive Test)	p-Value*
Prediabets all n (%)	**383 (79.5)**	**50 (10.4)**	**49 (10.2)**	**482 (100)**	-
Men n (%)	190 (70.6)	41 (15.2)	38 (14.1)	269 (100)	p<0.0001
Women n (%)	193 (90.6)	9 (4.2)	11 (5.2)	213 (100)	
Age ≤35y n (%)	110 (82.1)	11 (8.2)	13 (9.7)	134 (100)	p=0.5948
Age >35y n (%)	273 (78.5)	39 (11.2)	36 (10.3)	348 (100)	
Normotensive n (%)	331 (82.5)	41 (10.2)	29 (7.2)	401 (100)	p<0.0001
Hypertensive n (%)	50 (64.1)	8 (10.3)	20 (25.6)	78 (100)	
Non-obese n (%)	338 (82.8)	37 (9.1)	33 (8.1)	408 (100)	p<0.0001
Obese n (%)	45 (60.8)	13 (17.6)	16 (21.6)	74 (100)	

*P value is based on chi square tests

Declaration of interest: None

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