Obesity Research & Clinical Practice (2015) 9, 527—530

RESEARCH LETTER

Age cut-off for type 2 diabetes mellitus screening amongst young adults from Mures District, Romania — A pilot study

Introduction

Many studies were focused on identifying type 2 diabetes in children [1,2], but few were targeted on assessing type 2 diabetes in young adults.

The aim of this study was to establish if and when obesity starts to influence the glycemia level in early adulthood, by screening subjects from Mures District, Romania.

Material and methods

We carried out a cross sectional descriptive study to assess the relationship between BMI, waist circumference (WC) and glycemia. We organized a screening campaign to measure glycemia, BMI and WC targeting young adults, which was held on November 2012, helped by 111 volunteers from the University of Medicine and Pharmacy Tirgu Mures. The study protocol was approved by the Ethics Committee of University of Medicine and Pharmacy Tirgu Mures and the study was conducted in accordance with the Helsinki Declaration.

The participants were other medical students of the University of Medicine and Pharmacy Tirgu Mures than the promoters, and final year high school young adults — 18 years old (yo) from four high schools in Tirgu Mures. All enrolled voluntarily and gave their informed consent.

The volunteers discussed with high school students to provide information about the campaign, explained terms such as fast food, the importance of fasting, and other requirements: not drinking juice, tea or coffee, not smoking, chewing gum, or exercising. The fasting state, eating behaviors and family history of the subjects was assessed using a questionnaire with control items, written in Romanian.

Fasting capillary blood samples from the finger were collected. Subjects with glycemia higher than 110 mg/dl were advised to do the venous blood testing [3].

We only included in our analysis the participants who reported eating at least two fast food meals a week [4], to improve the reliability of the study.

To assess the age cut-off when BMI and WC start to influence glycemia, the subjects were stratified by age.

Statistical analysis included descriptive statistics and linear regression models (GraphPrism 5.0 Demo Version). A p value of less than 0.05 was considered significant.

Results

From the 500 participants who completed the questionnaire, we received 406 eligible responses (Table 1).

93 subjects (22.9%) from our study group were overweight or obese (BMI $\geq$ 25). 64 participants (15.76%) had a fasting capillary glycemia higher than 110 mg/dl.

In the 22 yo subgroup the increases of BMI and WC positively correlated with glycemia (Table 2).

Based on this result we compared the glycemia versus BMI and glycemia versus WC ($p < 0.0001$) in the 18—21 yo group and the $\geq$22 yo group (Figs. 1 and 2).

Discussion

Fast-food consumption has strong positive associations with weight gain and insulin resistance, promoting abnormal adipokines secretion, systemic

http://dx.doi.org/10.1016/j.orcp.2015.05.010

Table 1 The characteristics of the analyzed group.

N = 406 (F/M)	Minimum	Maximum	Median	Mean ± SD
Age (years)	18	35	21	22.09 ± 4.68
	18/18	35/35	21/21	22.19 ± 4.82/21.86 ± 4.35
Height (m)	1.38	1.95	1.68	1.694 ± 0.09
	1.38/1.56	1.94/1.95	1.65/1.79	1.656 ± 0.06/1.778 ± 0.08
Weight (kg)	29	164	61	64.29 ± 15.29
	32/29	164/124	58/73	59.78 ± 13.29/74.42 ± 14.64
Waist circumference (cm)	47	126	74	76.6 ± 11.30
	47/60	118/126	72/81	73.7 ± 9.65/83.09 ± 12.03
Glycemia (mg/dl)	65	358	97	99.13 ± 19.82
	65/73	358/160	97/96	99.96 ± 21.9/97.26 ± 13.94
BMI (kg/m^2)	14.8	39.6	21.6	22.45 ± 3.94
	14.8/16.7	39.6/36.6	21/23	21.83 ± 3.65/23.84 ± 4.22

	n (F/M)	% (F/M)	Mean ± SD (F/M)
Underweight (BMI <18.5)	47	11.58%	17.65 ± 0.68
	41/6	10.09%/1.47%	17.67 ± 0.71/17.55 ± 0.50
Normal weight (BMI 18.5 to 24.9)	266	65.52%	21.27 ± 1.67
	189/77	46.55%/18.96%	21.1 ± 1.65/21.72 ± 1.65
Overweight (BMI 25—29.9)	71	17.49%	26.7 ± 1.36
	41/30	10.1%/7.38%	26.63 ± 1.41/26.81 ± 1.31
Obesity grade 1 (BMI 30—34.9)	17	4.19%	32.06 ± 1.7
	8/9	1.97%/2.21%	31.88 ± 1.24/32.23 ± 2.1
Obesity grade 2 (BMI 35—39.9)	5	1.23%	36.9 ± 1.69
	2/3	0.5%/0.73%	38.45 ± 1.62/35.87 ± 0.63
Obesity grade 3 (BMI ≥40)	None		

Gender	*n*	%	CI
Male	125	69.21%	26.38—35.57%
Female	281	30.79%	64.43—73.62%

Provenience	(F/M)	(F/M)	(F/M)
Urban	323	79.56%	75.23—83.31%
	220/103	78.29%/82.4%	73.01—82.97%/74.57—88.63%
Rural	83	20.44%	16.69—24.77%
	61/22	21.71%/17.6%	17.03—26.99%/11.37—88.63%

Family history	(F/M)	(F/M)	(F/M)
Cardiovascular diseases	25	6.16%	4.10—9.07%
	15/10	5.34%/8%	3.02—8.65%/3.9—14.22%
Diabetes mellitus	39	9.61%	7.00—13.00%
	28/11	9.96%/8.8%	6.72—14.08%/4.48—15.2%%
Endocrine diseases	8	1.97%	0.92—4.00%
	6/2	2.14%/1.6%	0.79—4.59%/0.19—5.66%
Smokers	77	18.97%	15.34—23.19%
	49/28	17.44%/22.4%	13.19—22.93%/15.43—30.72%

N = number of participants included in the analysis; SD = standard deviation; CI = confidence interval; F = female; M = male.

inflammation and insulin resistance [5,6]. From this aspect, the moment when the metabolical changes became overt is essential. The 23 yo subgroup did not show significant correlation between glycemia and BMI or WC, probably because of the small number of subjects included, but the significant associations re-appeared in the >23 yo group. The fact that until the age of 22 there was no correlation between increasing BMI, WC and the glycemia could be explained by pancreatic compensation and the time required for the adipose cells to promote insulin resistance.

To the best of our knowledge this is the first study of its kind. The fact that it was a pilot study,