Aperito Online Publishing

Diabetes Research and Treatment
Open Access

Received : July 09, 2014
Accepted: Aug 25, 2014
Published: Aug 28, 2014

http://dx.doi.org/10.14437/DRTOA-1-101 Letter to Editor Gloria-Bottini F, Diabetes Res Treat Open Access 2014, 1:1

The Role of Sex and Age in the Development of Type 2 Diabetes in Obese Subjects

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Obesity is a risk factor for human health. Obese subjects could develop Type 2 Diabetes (T2D), Metabolic Syndrome (MS), Respiratory Diseases (RS), Cardio Vascular Disease (CVD). Not all obese subjects, however, become diabetic: this indicates an interaction between obesity genes and other environmental and genetic factors [1-3]. The relationship between obesity and T2D is dependent on race, familiar history of diabetes mellitus and the presence of maternal diabetes during pregnancy [4]. Experimental studies in genetically obese mice have shown that the risk of diabetes is dependent on interaction between obesity genes and other factor both genetic and environmental [1]. Our group has recently shown a significant role of p53 codon 72 and ACP1 (Acid Phosphatase locus 1) in the association between obesity and diabetes and we have observed that the effect of ACP1 is influenced by sex and age [5, 6].

In the present note we have examined in more details the effect of sex and age on the relative risk of T2D in obese subjects.

We have studied 303 subjects admitted consecutively to Valmontone Hospital for cardiovascular disease: Clinical data on these subjects are reported in a previous paper [6]. Mean age was 62 years. All subjects were from the White population. Informed written consent was obtained from the patients to participate to this investigation that was approved by the Ethical Committee.

A test of independence was performed by Pearson Chi square statistics. Odds ratio was evaluated as a measure of the strength of association. All analyses were carried out using SPSS programs.

The table shows the association of BMI with T2D separately in males and females and in subjects with an ageless or equal 62 years and greater than 62 years.

In both males and females the association between the two parameters is statistically significant but in

females the association is stronger than in males: in obese female the relative risk to become diabetic is about twice that of obese male.

Concerning age, in obese subjects aging 62 years or less the relative risk to become diabetic is about three times that observed in obese subject aging more than 62 years. We have also analyzed the sample according to the joint age-sex type. The maximum risk is observed in females aging 62 years or less followed by males aging 62 years or less, females aging more than 62 years and male aging more than 62 years: in this last group the association is not statistically significant [Figure].

In conclusion our analysis suggests that both age and sex influence the relative risk of diabetes in obese subjects. However, the fact that it has been performed in subjects with CVD represents a limitation of the study.

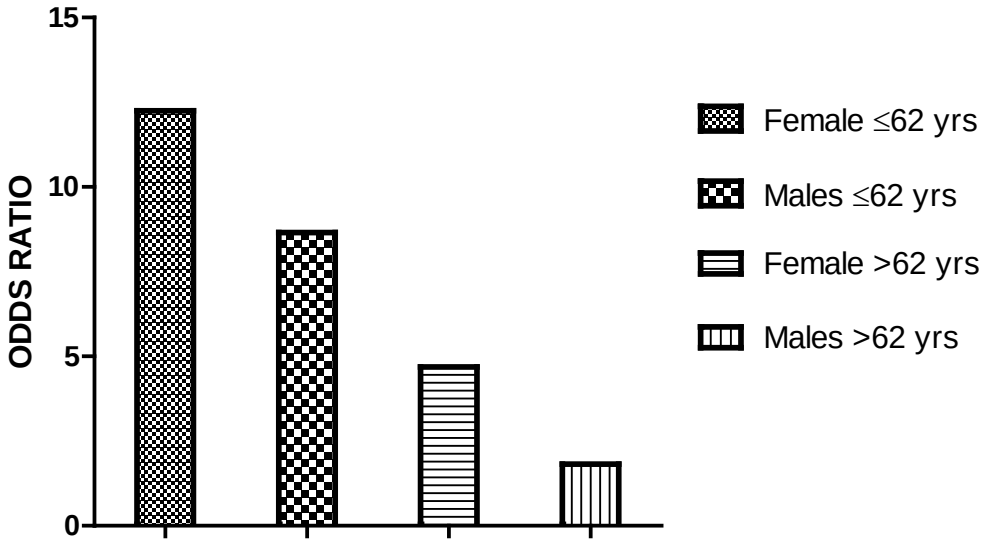

Fig. Relative risk to become diabetic in obese subjects. Effect of age and sex

Table: The effect of sex and age on the association between obesity and diabetes

		BMI	
		≤ 30	>30
SEX			
Female	Diabetic	13	22
	Non Diabetic	109	22
Chi-square test of independence χ2 df p 27.766 1 0.000 O.R. 8.38 95% C.I. 3.417-24.681			
Male	Diabetic	23	13
	Non Diabetic	88	13
Chi-square test of independence χ2 df p 7.872 1 0.005 O.R. 3.83 95%C.I. 1.430-10.302			
AGE			
≤62yrs	Diabetic	11	15
	Non Diabetic	123	17
Chi-square test of independence χ2 df p 26.382 1 0.000 O.R. 9.87 96%C.I. 3.559-27.857			
>62yrs	Diabetic	25	18
	Non Diabetic	74	18
Chi-square test of independence χ2 df p 6.352 1 0.01 O.R. 2.96 95% C.I. 1.240-7.085			
SEX and AGE			
Males ≤62yrs	Diabetic	7	8
	Non	53	7

	Diabetic		
Chi-square test of independence $\chi 2$ df p 10.547 1 0.001 O.R. 8.65 96%C.I. 2.037-38.729			
Males >62yrs	Diabetic	16	5
	Non Diabetic	35	6
Chi-square test of independence $\chi 2$ df p 0.295 1 N.S. O.R. 1.823 96% C.I. 0.403-8.217			
Females ≤62yrs	Diabetic	4	7
	Non Diabetic	70	10
Chi-square test of independence $\chi 2$ df p 13.450 1 0.000 O.R. 12.25 96% C.I. 2.560-6.292			
Females >62yrs	Diabetic	9	13
	Non Diabetic	39	12
Chi-square test of independence $\chi 2$ df p 7.125 1 0.008 O.R. 4.69 96% C.I. 1.430-15.832			

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