Diet relationship with the metabolic syndrome's elements

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INTRODUCTION

Diet modification is an important part of the metabolic syndrome's management but there is limited data regarding a direct relationship between food groups and the metabolic profile.

AIM

Evaluation of the influence of food groups on the elements of metabolic syndrome in a group of subjects with abdominal obesity.

METHODS

A cross sectional study was conducted in the Endocrinology Outpatient Clinic between February 2013 and April 2014. A sample of 290 subjects was analyzed. Inclusion criteria: abdominal obesity defined according to IDF definition. Exclusion criteria: treatment for the metabolic syndrome's elements. Variables: age, sex, environment, waist, body mass index, blood pressure, blood glucose, triglycerides, HDL cholesterol, food pyramid. Method: anthropometric evaluation, fasting blood sample, blood pressure measurement, food pyramid constructed based on an adapted food frequency questionnaire with 126 items analyzed with a web-based application especially developed. Statistical analysis used GraphPad Prism v. 5 and SPSS v17 with a level of significance α=0.05.

RESULTS

Mean age was 50.6 ±13.1 years with a sex distribution F: M 6.8:1 with the majority of subjects coming from urban areas (68.27%) (Table 1). In multiple regression analysis, the food pyramid elements explain 6.26% of the triglycerides variation (p=0.02) (table 2), 3.14% of the HDL cholesterol (p=0.31), 4.55% of the blood glucose (p=0.09), 7.25% of the blood pressure value (p=0.08) and 5.75% of the waist circumference (p=0.01) (table 3).

All of the metabolic syndrome elements are correlated with waist circumference (fig. 1) and significantly influence each other's variability.

Table 1 – General characteristics of the group

Mean age (years)	50.6±13.1
Sex distribution (F:M)	253:37 (6.8:1)
Environment distribution (U:R)	198:92 (2.1:1)
Obesity (%)	57.93
Impaired fasting glucose and diabetes (%)	39.65
Low HDL Cholesterol (%)	57.58
Increased triglycerides (%)	43.44
Hypertension (%)	54.13

Table 2 – Multiple regression model for triglycerides (r^2 = 6.26%, p=0.02)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Triglycerides	112,530	11,527		9,762	,000
Sweets	-4,183	2,296	-,139	-1,822	,070
Fat	-1,345	3,262	-,048	-,412	,681
Meat and protein	,254	3,357	,007	,076	,940
Milk	-7,607	4,036	-,161	-1,884	,061
Fruits & vegetables	1,890	1,254	,104	1,508	,133
Cereal	6,498	2,202	,210	2,951	,003

Table 3 – Multiple regression model for waist circumference (r^2 = 5.75%, p=0.01)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Waist circumference	101.924	2.113		48.23	,000
Sweets	-1.45	.423	-0.216	-3.43	0.001
Fat	-0.184	0.423	-0.3	-3.33	0.74
Meat and protein	1.28	0.6	0.166	2.12	0.03
Milk	-0.755	0.652	-0.07	-1.16	0.24
Fruits & vegetables	0.015	0.222	0.004	0.06	0.94
Cereal	0.04	0.41	0.006	0.1	0.91

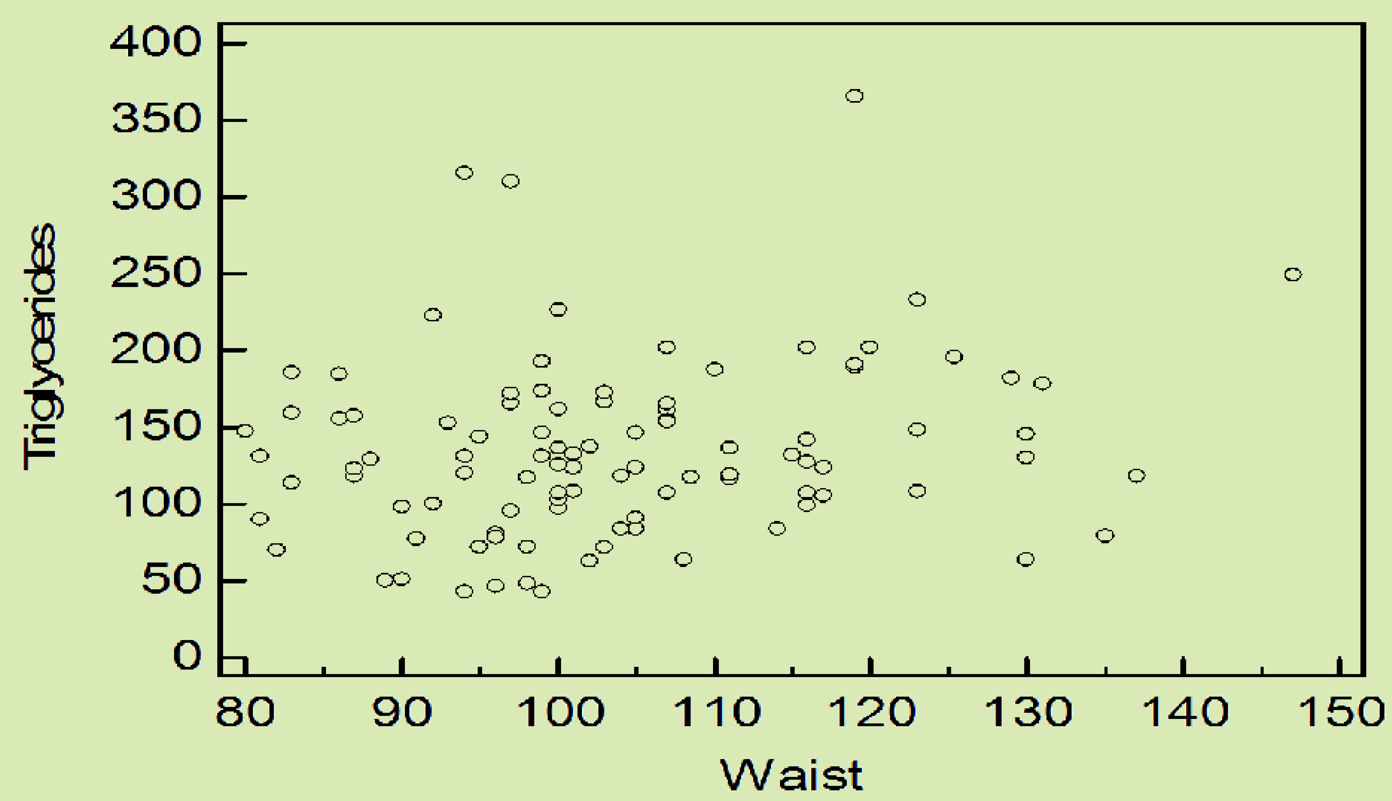

Figure 1 – Correlation waist circumference – triglycerides (r=0.22, CI 95% 0.02-0.4, p=0.02)

DISCUSSIONS

Although diet is a main component in the management of obesity and the metabolic syndrome (1), it influences them in a small degree. Diet modification should be evaluated in prospective studies together with physical activity assessment. Other studies have reported similar small percentages regarding diet and the metabolic dysfunctions (2). Physical activity and the composition of the diet might play a more important role in the development of metabolic dysfunctions.

CONCLUSIONS

The main food groups explain a small percentage of the metabolic syndrome's elements underlying the need for a more detailed dietary evaluation to define specific patterns associated with increase cardio-vascular risk.

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