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Title: Association between triglycerides and insulin resistance as a predictor of cardiometabolic diseases in university students

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Introduction

Cardiometabolic diseases represents the main cause of death in the world and several risk factors influence in different way. On the other hand, those risk factors appear at younger ages each time. One common factor is the insulin resistance and dyslipidemia. Some studies have suggested that higher levels of triglycerides are an independent risk factor for insulin resistance and in the future the possible development of diabetes and cardiovascular diseases.

Methodology

Students from the Centro Universitario de Ciencias Exactas e Ingenierías of the University of Guadalajara, Mexico, with the following characteristics was recruit: aged between 18 and 25, with 10 to 12 hours of fasting, were recruited for this study. They attended to the Biochemistry Laboratory, where personal data was registered, a clinical history was filled out and somatometric measurements were obtained. At the end, a blood sample was taken.

Transversal analytic study type. The next parameters were determined.

- Body Mass Index.
- Serum analysis of total cholesterol (TC), triglycerides and glucose, and insulin.
- A cut off point of >150 mg/dL was considered for hypertriglyceridemia and for insulin resistance HOMA index > 2.5 was used

Results

Variable	Women n= 116	Men n= 73	% Impaired
Age (years)	20.52 ± 1.44	21.0 ± 1.91	
BMI (Kg/m^2)	24.8 ± 5.26	28.11 ± 6.48	67% (127)
Total Cholesterol (mg/dL)	168.5 ± 34.57	162.34 ± 34.30	
Triglycerides (mg/dL)	97.99 ± 51.03	112.90 ± 55.36	17% (33)
HDL (mg/dL)	50.13 ± 13.03	40.3 ± 9.18	
LDL (mg/dL)	99.61 ± 26.06	95.14 ± 38.47	
Glucose (mg/dL)	83.61 ± 7.99	85.55 ± 8.82	
Insulin (mU/L)	10.28 ± 0.44	12.51 ± 9.62	
HOMA ($mU*mmol/L^2$)	2.06 ±1.54	2.55 ± 1.86	30% (57)

The association between IR and hypertriglyceridemia was performed. An Odds Ratio (OR) of 3.890 p<0.0004 (CI 1.771-8.545) was obtained. This result shows that the presence of elevated triglyceride levels can be considered per se a cardio-metabolic risk factor, since it increases the likelihood of insulin resistance to a great extent, that along with these two factors, represent an increased risk of these diseases.

Conclusions

- Higher BMI, triglyceride, glucose, insulin and HOMA values were observed in males.

- Similarly, females have a lower prevalence of hypertriglyceridemia. However, they are almost equally prevalent as the male gender in terms of insulin resistance.

- With these data, we can conclude that hypertriglyceridemia can indeed be associated with insulin resistance. The volunteers were young students, reason for which it is necessary to insist on a lifestyle improvement, because despite their young age, some severe disorders have been observed, which will have repercussions in their adult life.

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