Lipid profile and associated factors among an academic community of Higher Education

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ABSTRACT

Lipid profile, glycaemia and body mass index (BMI) present a direct relationship with lifestyles, eating habits and practice of physical activity. The aim of this study was to evaluate the lipid profile, glycaemia and relate these variables to each other and to the level of physical activity and BMI in an academic community of Higher Education. Furthermore, it was analysed whether gender and age group influence these parameters. A convenience sample of sixty-six participants complete an anonymous questionnaire and were submitted to capillary blood sample collection. Lipid profile and glucose levels were determined by the enzymatic assay. BMI was determined from weight and height measurements, and the level of physical activity was calculated through the application of a questionnaire (IPAQ). Findings showed a positive correlation between glucose values with triglycerides and BMI and the same for Total cholesterol with the remaining values of the lipid profile. A negative correlation was found between HDL cholesterol and BMI. Concerning age group and gender it was verified that there were higher values of Total cholesterol and HDL in female compared to male counterparts and increased glucose levels, Total cholesterol, LDL, triglycerides and BMI, with increasing age. Concerning lipid profile, there were alterations in 42% of the individuals, and in relation to the glycaemia there were alterations in 2% of the individuals. 21% of individuals showed risk of pre-obesity and 3% of obesity. Findings could support educational strategies in academic context in favour of cardiovascular risk reduction.
Keywords: Lipid profile; Glycaemia; Body Mass Index; Physical activity; Academic community.

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INTRODUCTION

Although there are several factors which contribute to a higher risk of developing cardiovascular diseases, it is well-known that some of them are modifiable, such as physical inactivity, eating patterns and smoking habits (Robbins, Dietz, Cox, & Kuklina 2013). An increase in physical activity is associated with a significant reduction in the risk of cardiovascular-related death and also can attenuate or reverse the disease process in patients with cardiovascular disease, which can be mainly explained by a reduction in the plasma triglyceride concentration (Bellou et al., 2013; Warburton, Nico & Bredin, 2006). The aim of this study was to evaluate the lipid profile, glycaemia and relate these variables to each other and to the level of physical activity and Body Mass Index (BMI) in an academic community of Higher Education. Furthermore, it was analysed whether gender and age group are also related with these parameters.

MATERIAL AND METHODS

Participants

Participants were recruited from 3 high schools of the Polytechnic Institute of Lisbon (students, teachers and other staff) originating a convenience sample of 66 participants (52 women; 14 men), aged between 18-61 years old.

Measures and Procedure

Prior to data collection, subjects signed an informed consent. Data collection was performed in two stages. Firstly, participants completed the International Physical Activity Questionnaire (IPAQ), concerning duration and level of physical activity. Secondly, capillary blood sample collection was performed to determine lipid and glycaemia profile, using Cholestech LDX equipment, using enzymatic methods. LDL value was calculated using Friedwald's formula. Height and weight were measured for BMI calculation. All procedures performed in this study were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Analysis

The statistical analysis was based on a descriptive statistic (e.g. mean, median, standard deviation) and non-parametric statistic inference (e.g. Spearman's Ordinal Correlation Coefficient and Mann-Whitney Test).

RESULTS

The results for the different parameters were as follows: glycaemia - M=90.20, SD=17.05; Total cholesterol -M=161.23, SD=31.02; HDL - M=53.53, SD=13.82; LDL - M=84.77, SD=25.86; triglycerides - M=115.61, SD=67.30; BMI - M=23.52, SD=3.60. Concerning lipid profile and glycaemia, 42% and 2% of the individuals, respectively, showed abnormal results. Regarding BMI values, 21% of the individuals are in pre-obesity and 3% are already obese.

There was a significant correlation between the parameters: glycaemia and triglycerides ($r_s[66]=.251$, $p<.050$); glycaemia and BMI ($r_s[66]=.269$, $p<.050$), Total cholesterol and triglycerides ($r_s[66]=.457$, $p<.001$) and HDL cholesterol and BMI ($r_s[66]=-.440$, $p<.001$).

The Mann-Whitney test showed that Total and HDL cholesterol was statistically significantly higher in women ($p<.050$; $p<.001$, respectively). The same test gave statistically significantly higher glycaemia, Total

cholesterol, LDL, triglycerides and BMI in the over 34 years old group (p<.050; p<.001; p<.001; p<.050; p<.001, respectively).

DISCUSSION

The findings confirm the presence of 42% of individuals with one of the lipid profile parameters altered, which is higher than what was reported in similar studies (Assis et al., 2011). As was expected, there was an association between the increase in Total Cholesterol levels and the increase in the levels of LDL Cholesterol and Triglycerides in the study population. On the contrary, a positive association between Total Cholesterol and HDL Cholesterol was found. A significant negative correlation was confirmed, between HDL levels and BMI values, which is in line with the expected, since a decrease in weight and, consequently, a decrease in BMI, leads to an increase in HDL Cholesterol (Coelho et al., 2005). Regarding physical activity, there was no correlation between the remaining variables. These results are not according to that reported in some studies, since there is an association of a decrease of triglycerides; as well as a substantial increase in HDL levels, decreased levels of LDL, BMI, Glucose and Total Cholesterol, when increasing physical activity (Bellou et al., 2013; Wang & Xu, 2017). Females showed higher values of Total cholesterol and HDL cholesterol compared to male counterparts, which is aligned with other studies (Coelho et al., 2005). Concerning age, it was found that individuals with more advanced ages presented higher values for glucose, Total cholesterol, LDL, triglycerides parameters and higher BMI.

CONCLUSIONS

The information presented in this study highlights that academic context, could provide an additional setting for intervention and prevention efforts targeting cardiovascular risk disease and could guide prevention strategies based on educational campaigns.

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