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Epidemiology of cardiovascular risk factors in adolescents

by

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Objective: To describe the epidemiology of cardiovascular risk factors (i.e. lipids profile, blood pressure and excess weight) in a sample of European adolescents.

Methods: Within the framework of the multicenter cross-sectional HELENA study (Healthy Lifestyle in Europe by Nutrition in Adolescence) 3546 adolescents were selected by random cluster sampling in 10 European cities. LMS curves were used to estimate rates of total overweight and obesity (OW/OB) by BMI. Central OW/OB was estimated with the use of age- and sex-specific cut-offs for waist circumference (WC). Two consecutive measurements of systolic (SBP) and diastolic blood pressure (DBP) were obtained. A family affluence scale (FAS) was created from four items: own bedroom, how many cars, how many computers and internet connection at home (categorized into ≤ 3 items and ≥ 4 items). Blood samples were obtained from 1097 adolescents. Total cholesterol (TC), low density lipoprotein cholesterol (LDL-c) and high density lipoprotein cholesterol (HDL-c) were measured by enzymatic methods and then categorised based on the AHA guidelines for children and adolescents.

Results: In boys higher rates of total and central OW/OB (based on BMI and WC, respectively) were observed compared to girls (total: 26.0% vs. 19.4%; central: 19.5% vs. 14.4%, all $p<0.001$). Higher rates of both total and central OW/OB were observed for adolescents with lower FAS. Lower percentages of boys had abnormal lipid profiles when compared to girls (TC: 4.8% vs. 10.8%; LDL-c: 5.9% vs. 11.4%, all $p<0.001$). Boys also had higher SBP compared to girls (125.2mmHg vs. 116.1mmHg, $p<0.001$). Both total and central OW/OB was related with abnormal lipid profiles and higher BP for both boys and girls. FAS was inversely related only with DBP in boys. No difference was observed for SBP and DBP between adolescents with normal and abnormal lipid profiles. In multivariate analysis models, central OW/OB could better predict an abnormal profile for TC, LDL-c and HDL-c compared to total OW/OB, controlling for FAS, Tanner stage, age and sex.

Conclusion: High rates of both total and central OW/OB were observed for European adolescents. However, central OW/OB better predicted abnormal values for several lipids indices and thus WC may be a better tool for the identification of adolescents with unfavourable lipids profile compared to BMI. Special emphasis should be given to the behavioural factors that are linked to higher risk for cardiovascular disease in adolescents in Europe.

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