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Effect of multidisciplinary educational programs delivered to scholar children on cardiovascular risk profile of their relatives: Systematic review and meta-analysis

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Background: Multidisciplinary educational programs involving scholar children and their relatives could be an easy and scalable preventive measure to face the increasing burden of cardiovascular diseases. Nevertheless such programs are not common in our context. Objective: To identify, summarize and analyze studies reporting multidisciplinary educational programs involving scholar children and the reported effect on cardiovascular risk factors in their relatives. Methods: A predefined protocol in accordance with the PRISMA was used. Electronic searches in Medline, PubMed, Embase, Cochrane Library, IBECS, SciELO and LILACS were conducted through March/2014 involving multidisciplinary educational programs with parallel group design. Reported outcome variables were high-density cholesterol (HDL), low density cholesterol (LDL), triglycerides, systolic blood pressure (SBP) and diastolic blood pressure (DBP) measured in children's relatives before and after interventions. Random effect was used to summarize pooled effects and heterogeneity was analyzed by I2. Quality of studies was evaluated with the Cochrane risk of bias tool. Results: Of the 4253 studies found, four reached the inclusion criteria for the systematic review and two were included in the meta-analysis contributing to three separate samples. Included studies involved 787 children (3–11 years) and 711 relatives. Interventions lasted 512 months and the pooled effects (95% CI) in relatives were: HDL 1.78 (0.10; 3:47) mg/dL (I 2 = 0%, p = 0.819), LDL −5:53 (−1:52, −9:55) mg/dL (I 2 = 70.4%, p = 0.034), triglycerides −4.45 (−18.69, 9.78) mg/dL (I 2 = 47.1%, p = 0.151), SBP −2.60 (−4:43, −0.86) mm Hg (I 2 = 0.0%, p = 0.956), DBP −2.02 (−3.23, −0.82) mm Hg (I 2 = 54.4%, p = 0.095). Methodological criteria were generally low and risk of bias was high across studies. Conclusion: Evidence on scholar programs involving LM is weak. Paucity of studies and the absence of some methodological criteria indicate that research in cardiovascular primary prevention involving scholars and their relatives is warranted.

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Carotid intima–media thickness and carotid plaque represent different adaptive responses to traditional cardiovascular risk factors

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Introduction: Carotid intima–media thickness (CIMT) is considered a reflection of multiple risk factors; however, primary contributors to intima–media thickening are age and hypertension, which do not necessarily reflect the atherosclerotic process. CIMT and carotid plaque, although correlated, reflect different stages and aspects of atherosclerosis and have distinct determinants. Objectives: To assess the effects of each traditional cardiovascular risk factor (hypertension, diabetes mellitus, dyslipidemia, and smoking), including the presence of coronary artery disease (CAD), on CIMT and to assess the degree of carotid plaque occurrence. The correlation between the presence of plaque and CIMT was also investigated. Methods: A total of 553 outpatients (216 men and 337 women; mean age 67.06 ± 12.44 years) who underwent a carotid artery ultrasound were screened for carotid plaque, and CIMT was measured. Results: The CIMT medians were higher in males ($P < .001$) and in patients with hypertension ($P < .001$). A linear increase occurred in mean CIMT of 0.0059 mm for each year of increase in age. The presence of plaque indicated a tendency to correlate with CIMT ($P = .067$). The presence of hypertension associated with diabetes ($P = .0061$; estimated difference 0.0494 mm) or dyslipidemia ($P = 0.0016$; estimated difference 0.0472 mm) or CAD ($P = .0043$; estimated difference 0.0527 mm) increased the mean CIMT measurements. The probability of plaque occurrence in carotid arteries is influenced by the age ($P < .001$) and is higher in patients with dyslipidemia ($P = .008$) and CAD ($P < .001$). Conclusions: CIMT and carotid plaque have different influences than traditional cardiovascular risk factors have. Hypertension is the strongest cardiovascular risk factor that increases CIMT, followed by age and male sex, compared to diabetes mellitus, dyslipidemia, and smoking. The presence of dyslipidemia and CAD increases the probability of the occurrence of carotid plaque. The presence of plaque indicated a tendency to correlate with CIMT. Increased CIMT and plaque could be present in the same patient caused by different risk factors and having independent effects on the artery wall and different clinical prognostic outcomes. There is no current evidence to suggest that CIMT may always progress to atherosclerotic plaque.

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Assessment of intima–media thickness in healthy children aged 1 to 15 years old

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Introduction: The assessment of cardiovascular risk in pediatric patients is challenging. Cardiovascular events or death rarely occur in children, but changes in the cardiovascular system can be identified at an early age in pediatric populations. Carotid intima–media

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thickness (CIMT) measurements have been assessed in several observational and interventional studies. However, previous studies assessing gender differences in CIMT in healthy pediatric populations have generated conflicting results. Aim: The aim of the present study was to evaluate the influence of gender, age and body mass index (BMI) on CIMT in healthy children aged 1 to 15 years old. Methods: We included 280 healthy children (male, n = 175; mean age, 7.49 ± 3.57 years; mean BMI, 17.94 ± 4.1 kg/m^2) in the study. Children with diagnosis of diabetes, dyslipidemia or hypertension were excluded from the analysis. Children considered overweight or obese (≥85th percentile) for age were not included in the study The subjects were divided into 3 groups according to age: 1 to 5 years old (n = 93 [33.2%]; male, n = 57; mean BMI, 16 ± 3 kg/m^2), 6 to 10 years old (n = 127 [45.4%]; male, 78; mean BMI, 17.9 ± 3.7 kg/m^2), and 11 to 15 years old (n = 60 [21.4%]; male, 40; mean BMI, 20.9 ± 4.5 kg/m^2). Results: We observed no significant difference in CIMT values between male and female children in the total population (0.43 ± 0.06 mm vs. 0.42 ± 0.05 mm, respectively; p = 0.243). CIMT was not correlated to BMI in the total population or in the 3 age groups according to the Pearson correlation coefficients (1 to 5, p = 0.11; 6 to 10, p = 0.91; 11 to 15, p = 0.92). Children aged 10 to 15 years had the highest CIMT values (1 to 5 vs. 6 to 10, p = 0.615; 1 to 5 vs. 11 to 15, p = 0.02; 6 to 10 vs. 11 to 15, p = 0.004). Conclusions: Among healthy children younger than 15 years old, there is no significant difference in CIMT between males and females. BMI was not correlated to CIMT in healthy children younger than 15 years old. CIMT is constant in children younger than 10 years old, regardless of gender and BMI. CIMT increases after the age of ten years.

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Reduction on titers of natural antibodies to ApoB-D peptide is associated with reduction on endothelial function in HIV-infected patients

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Background: Humoral immune responses against oxidized LDL (oxLDL) and ApoB-derived peptides are associated with subclinical atherosclerosis and endothelial function. HIV infection can affect humoral immune responses to these antigens, and also modify cardiovascular risk factors. This study was aimed at evaluating the humoral immune responses and cardiovascular risk factors in HIV-infected patients. Methods: A case–control study included HIV-infected individuals, naïve of anti-viral therapy, and non-infected controls. Subclinical atherosclerosis was assessed by measurements of intimal media thickness of the carotid arteries, obtained by ultrasound (cIMT). Endothelial function was evaluated by flow-mediated dilatation of the brachial artery. The humoral immune responses were assessed by measuring levels of autoantibodies (IgG and IgM) against oxLDL, anti-ApoB-D and anti-pep0033 (ELISA). Inflammatory cytokines (IL-6, IL-8, IL10, TNF-α e IFN-γ) were also analyzed by ELISA. Results: Ninety-three (53 non-HIV / 40 HIV-infected) subjects of both genders, ageing [mean (SD)] 30 (1) years, with 3.6 (1–6) years of infection were included in the protocol. HIV-infected patients presented lower levels of HDL-c (P = 0.008) and total cholesterol (P = 0.028), when compared with controls. Higher concentrations of the immune markers IL-6 (P = 0.028), C-reactive protein (P = 0.017), interferon gamma (P = 0.021), tumor necrosis factor (P = 0.020), were seen in HIV-infected subjects, without differences between groups in IL-8 and L-10. Flow-mediated dilatation was lower in HIV-infected patients [9.3 (1.1) vs 13.7 (2.4), P = 0.04], compared with controls. However, we did not observe differences on cIMT [0.61 (0.56–0.67) vs 0.63 (0.55–0.67), P = 0.971]. In HIV-infected patients the titers of IgG anti-oxLDL [6.24 (3.76–8.14) vs 2.09 (1.16–3.45)] and IgG anti-ApoB-D [3.4 (2.92–4.85) vs 2.00 (1.52–2.90)] were higher than in controls (P < 0.05), whereas the levels of IgM anti-ApoB-D [0.94 (0.67–1.12) vs 1.00 (0.58–1.58)] were lower than those observed in non-infected controls. We did not observe differences in other humoral immune responses among groups. In addition, IgM anti-ApoB-D titers were associated with endothelial function in HIV-infected individuals [β = 7.28; P = 0.002]. Conclusions: HIV-infected patients, naive of anti-viral therapy present reduced flow-mediated dilatation of the brachial artery associated with lower titers of natural autoantibodies (IgM) anti-ApoB-D.

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Relationship between occupational stress and hypertension

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Introduction: Occupational stress is considered an important factor in worsening the health of workers, being responsible for a significant decrease in job performance and increase in the cardiovascular risk. Stress can cause several changes in the individual's body that can lead to the development of chronic diseases such as high blood pressure (hypertension). Objective: The aim of this study was to identify whether there is a relationship between occupational stress and hypertension in women who develop their work activities in the hygiene sector of a university hospital. Methods: From a total of 42 employees, the sample consisted of 22 female participants aged between 36 and 59, containing 6-smoking participants. For data collection we used two questionnaires, the SF36 which refers to the evaluation of quality of living conditions and Job Stress Scale, in its Brazilian version "Stress Scale at Work" which refers to occupational stress evaluation. Indirect measurement of systolic and diastolic blood pressures and heart rate was also realized. The data were submitted for statistical analysis, in which the stress variables and blood pressure data were grouped in 2 × 2 contingency tables and followed by calculations of prevalence ratio and odds ratio, which can determine the association between exposure (stress) and the outcome/effect (hypertension). Moreover, we calculated the confidence intervals and performed the chi-square test of Pearson to determine the associations. Results: The results showed that 50% of the studied population has high blood pressure rates with indicative of being suffering from occupational stress. Nevertheless, the statistical results for the association between occupational stress and hypertension did not reach a significant value (p = 0.065). Conclusion: It was not possible to state a relationship between occupational stress and the incidence of hypertension, although we can notice the tendency of the association between these variables. Furthermore, it was found a high prevalence of hypertension in the population studied. This study exemplifies the need to invest in primary health care, thereby decreasing the rates of chronic diseases in the population.

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