Serum fatty acid composition in primary school children is associated with serum cholesterol levels and dietary fat intake

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Abstract

OBJECTIVE: To examine the serum fatty acid composition, serum cholesterol levels, and dietary fat intake associated with body composition in primary school children of both urban and rural regions in Taiwan. DESIGN: Subjects were randomly stratified by region and primary school. The sample consisted of 870 children aged 10 and 11 y old. The sample was equally distributed between an urban region (Kaohsiung City) and a rural region (Yunlin County). The gender ratio of samples from each area was matched. Food record-assisted 24-h dietary recalls and serum lipid measurements were collected for each child, and associations between serum total cholesterol (TC) and fatty acids composition as well as between body mass index (BMI) and triceps skinfold (TSF) were evaluated for both urban and rural regions. RESULTS: Compared with students in the urban region, those in the rural region had significantly lower total fat intake, BMI, TSF, TC, and LDL cholesterol (LDL-C) and higher HDL-cholesterol (HDL-C) ($P<0.05$). Increased total fat ($P<0.05$) as a proportion of total energy was associated with increased TC and LDL-C. Lauric, myristic, and oleic acid levels in the serum of urban boys were significantly higher ($P=0.0001$, 0.0003, and 0.0398, respectively) than those of rural boys. In girls, the different fatty acid compositions affected TC concentrations, and palmitic and stearic acids of serum in the high-TC group were significantly lower ($P=0.0179$ and 0.0001, respectively) than those in the low-TC group. CONCLUSIONS: Urban children had a dietary fat intake that both quantitatively and qualitatively differed from the traditional rural Chinese diet in Taiwan as reflected in rural children. Consumption of total fat was positively associated with BMI, TSF, TC, and LDL-C levels in Taiwanese children aged 10 and 11 y. SPONSORSHIP: This study was partly sponsored by a research grant from the Department of Health, Taiwan, ROC.