Contribution of body fat mass measurements in the global assessment of nutritional status in Argentinean children

Background: Excess weight is a public health problem in Argentina. BMI is used to evaluate overweight and obesity in national surveys. Taking into account that WHO defines obesity as an excessive fat accumulation that may impair health, its evaluation gained special significance as an associated risk factor. Previously, we observed high variability of fat mass in children when using different prediction equations obtained elsewhere. After receiving technical capacity during IAEA regional projects, we had the opportunity to assess fat mass in the community by isotopic dilution reference method. Objective: To evaluate fat mass in Argentinean children. Methods: 243 subjects, both sexes, 6-12 y, from Province of Buenos Aires, were evaluated. The work team moved to schools, health units and recreation centers to conduct the assessment. Children were weighed and measured and BMI (kg/m2) was calculated. Nutritional status was categorized into normal weight(N), overweight(O), obesity I(OI) and II(OII), according to BMIZscore. Waist circumference (WC,cm) and skinfolds (SKF,mm) were measured. After a basal saliva sample was collected, children received an oral dose of 0.5g D2O/kg and a second sample was collected after 3 hours post-dose. Deuterium was determined by FTIR to obtain total body water, fat-free mass and fat mass (FM%). Discordance between BMI and FM% was analyzed, considering a suggested value of FM% ≤30% in girls and ≤25% in boys. Serum cholesterol and triglycerides (mg/dl) were determined in a subsample (n=97). Results: Overweight and obesity were 28% and 16%, respectively. FM% was 29.5±7.1 (Girls:32.7±6.2 vs Boys: 26.1±6.4,p<0.01). Gradual increase of FM% was observed either in girls (N=29.2±4.4 vs O=35.6±4.8 vs OI=39.3±4.5 vs OII=44.9±3.7; p<0.01) or in boys (N=22.9±4.4 vs O=27.9±4.7 vs OI=32.7±6.1 vs OII=40.4±4.6; p<0.01). It was found that 18% girls and 16% boys presented higher FM% than the suggested value, even with normal BMI. FM% was positively associated with WC (r=0.57,p<0.01), SKF (r=0.80,p<0.01), cholesterol (r=0.22,p<0.01) and triglycerides (r=0.45,p<0.01). Conclusions: This is the first approach in the knowledge of children's fat mass in community based studies by isotope dilution technique in Argentina. An increase in adiposity associated with childhood obesity was observed; moreover, it should be noted that increased body fat was also found in normal-weight children. Considering that adiposity increases the risk of insulin resistance and dyslipidemia, the evaluation of fat mass is useful to identify children at risk who are not detected by BMI. Moreover, the positive association between fat mass and anthropometric variables allows them to be considered in the generation of validated prediction equations, not yet available, to contribute to monitoring programs.

Country

Argentina

Institution

University of Buenos Aires. Faculty of Pharmacy and Biochemistry. Department of Nutrition

Primary author: Prof. PALLARO, Anabel (University of Buenos Aires. Faculty of Pharmacy and Biochemistry. Department of Nutrition.)

Co-authors: Ms PAGANINI, Amalia (University of La Plata. Faculty of Humanities and Educational Sciences. IDHICS. CONICET); Mr NÁPOLI, Cristian (University of Buenos Aires. Faculty of Pharmacy and Biochemistry. Department of Nutrition); Prof. TARDUCCI, Gabriel (University of La Plata. Faculty of Humanities and Educational Sciences. IDHICS. CONICET); Dr FERNANDEZ, Inés (University of Buenos Aires. Faculty of Pharmacy and Biochemistry. Department of Nutrition); Dr VIDUEIROS, Silvina Mariela (University of Buenos Aires, Faculty of Pharmacy and Biochemistry, Department of Nutrition)

Presenter: Prof. PALLARO, Anabel (University of Buenos Aires. Faculty of Pharmacy and Biochemistry. Department of Nutrition.)

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