Short- and long-term beneficial effects of a multidisciplinary therapy for the control of metabolic syndrome in obese adolescents

Danielle Arisa Caranti a, Marco Túlio de Mello a, b, c, Wagner L. Prado a, Lian Tock a, Kâli O. Siqueira a, Aline de Piano a, Mara C. Lofrano a, Dejaldo M. J. Cristofalo b, Henrique Lederman b, Sérgio Tufik c, Ana R. Dâmaso a, b, c, d, *

a Post Graduate Program of Nutrition, Federal University of São Paulo, São Paulo 04020-060, Brazil
b Department of Diagnostic Imaging, Federal University of São Paulo, São Paulo 04020-060, Brazil
c Department of Psychobiology, Federal University of São Paulo, São Paulo 04020-060, Brazil
d Department of Health Sciences, Federal University of São Paulo, São Paulo 04020-060, Brazil

Received 25 October 2006; accepted 2 May 2007

Abstract

Visceral fat is highly correlated with metabolic syndrome in obese adolescents. The aims of this study were to determine the prevalence of metabolic syndrome and to assess the effect of a long-term (1 year) intervention with multidisciplinary therapy in predicting metabolic syndrome among obese adolescents, as well as to compare short- with long-term therapy. Eighty-three postpuberty obese adolescents were recruited, including 37 boys (body mass index [BMI], 36.19 ± 3.85 kg/m²) and 46 girls (BMI, 35.73 ± 4.42 kg/m²). Body composition was measured by plethysmography using the BOD POD body composition system (version 1.69, Life Measurement Instruments, Concord, CA), and visceral fat was analyzed by ultrasound. Metabolic syndrome was determined according to the World Health Organization criteria. Patients were assigned to a weight loss multidisciplinary intervention consisting of nutritional, exercise, psychological, and clinical therapy. At the beginning of therapy, we found that 27.16% of the obese adolescents presented metabolic syndrome, whereas only 8.3% did so after intervention. Indeed, in boys, BMI (36.19 ± 3.85 to 32.06 ± 5.85 kg/m²), visceral fat (4.88 ± 1.35 to 3.63 ± 1.71 cm), homeostasis model assessment of insulin resistance (4.77 ± 3.41 to 3.18 ± 2.33), and percentage of body fat (38.24% ± 6.54% to 30.02% ± 13.43%) presented a statistically significant reduction; and their fat-free mass percentage increased (62.14% ± 5.78% to 69.17% ± 12.37%). In girls, after long-term therapy, BMI (35.73 ± 4.42 to 33.62 ± 3.78 kg/m²), visceral fat (3.70 ± 1.40 to 2.75 ± 1.01 cm), and percentage of body fat (46.10% ± 5.66% to 39.91% ± 5.59%) showed a statistically significant reduction; and their fat-free mass increased (53.61% ± 5.65% to 59.82% ± 5.78%). In conclusion, long-term multidisciplinary therapy was effective in promoting beneficial changes in some predictors and decreasing the prevalence of metabolic syndrome in obese adolescents.

© 2007 Elsevier Inc. All rights reserved.

1. Introduction

Obesity has emerged as a major health problem worldwide [1]. The prevalence of overweight in youths has increased dramatically in recent years, especially among children in minority ethnic groups. Recent data suggest that the prevalence of overweight (body mass index [BMI] >95th percentile for age and sex) among Latino children has approximately doubled in the past 10 years, in such a way that 23.4% of Latino youths aged 12 to 19 years are overweight [2].

Adolescence, the transitional period that begins with puberty, is marked by physiological, dynamic, and psychological changes in boys and girls. Mediated in part by hormonal influences, patterns of fat distribution during this developmental period also demonstrate sex differences. Pronounced centralization of fat stores with increase in subcutaneous and visceral fat in the abdominal region occurs in boys. In addition, fat tends to be deposited peripherally in breasts, hips, and buttocks in girls during this period. Adolescence has also been emphasized as a critical period