

Childhood obesity and type 2 diabetes: the frightening epidemic

Nicola Santoro

New Haven, CT, USA

The prevalence of childhood obesity is dramatically increasing worldwide.^[1] In 2010 about 35 million children were estimated to be overweight or obese, and this number is thought to double by 2020.^[1] The increase of childhood obesity is accompanied by an increased prevalence of diseases once believed to be exclusive to adulthood, such as type 2 diabetes.^[2] Type 2 diabetes results from the imbalance between insulin secretion and resistance, therefore it typically occurs during puberty when there is a natural transient state of insulin resistance.^[3]

Although type 2 diabetes in youth closely resembles type 2 diabetes in adults, it shows some peculiar characteristics. In particular, glucose dysregulation progresses toward overt diabetes faster in youths than in adults. In fact, while in adults the transition toward type 2 diabetes takes about 10 years with about 7% reduction per year in beta cell function,^[4,5] in obese youth, the reduction of beta cell function occurs at a rate of about 15% per year,^[6] with a mean transition time from pre-diabetes to overt diabetes of about 2.5 years.^[7] Also, youths with type 2 diabetes seem to be resistant to pharmacological mono-therapy (with metformin or rosiglitazone) and to lifestyle intervention.^[8] The Treatment Options for Type 2 Diabetes in Adolescents and Youth (TODAY) study, a study involving several centers in the U.S., showed discouraging results.^[8] The TODAY study involved youth with type 2 diabetes and consisted of three arms: treatment with metformin alone, metformin plus lifestyle intervention, and metformin plus rosiglitazone; the endpoint was glycated hemoglobin

level (HbA1c). Half of the patients receiving the treatment with metformin alone failed, metformin plus lifestyle intervention did not improve glycemic control, and although the treatment with rosiglitazone and metformin improved durable glycemic control, 39% of the patients still had a failed treatment.^[8]

Evidence from this multi-center study suggests that type 2 diabetes can be a one-way trip for most of our patients, which is why more efforts should be made to prevent this condition, with early intervention in obese children before the onset of pre-diabetes or type 2 diabetes. This consideration raises further questions: Which is the best treatment for childhood obesity? Is any weight management program effective in obese children? Some encouraging data derive from the Bright Bodies program (<http://www.brightbodies.org>), a lifestyle intervention program held in some schools in New Haven (CT).^[9] In particular, the program consists of exercise twice (50 minutes each) and classes of nutrition/behavior modification once (40 minutes each) per week.^[9] Data from a controlled randomized trial where participants were randomly assigned to either a control or weight management group (Bright Bodies Program) for 6 months showed that the Bright Bodies weight management program had beneficial effects on body composition and insulin resistance in overweight children that were sustained up to 12 months.^[9] Also, more recently, the same group showed that these weight changes can be sustained up to 24 months after intervention.^[10]

These data clearly suggest that the most powerful weapon against non-complicated childhood obesity is lifestyle intervention. One major pitfall is to consider the lifestyle intervention only as a therapeutic approach, and this brings me to my final consideration. What we generically call lifestyle intervention (or lifestyle changes) simply means: increased physical activity, less sedentary life and better quality food. These three things should be easily available and accessible to everybody, but in a globalized world where inequality and poverty are the rule rather than the exception, childhood obesity is "the global health problem" and it needs to be solved from a political point of view as much as from a medical perspective.

Author Affiliations: Department of Pediatrics, Yale University School of Medicine, New Haven, CT, USA (Santoro N)

Corresponding Author: Nicola Santoro, MD, PhD, Department of Pediatrics, Yale University School of Medicine, 330 Cedar Street, P.O. Box 208064, New Haven 06520, CT, USA (Tel: 203-737-6356; Fax: 203-785-6421; Email: nicola.santoro@yale.edu)

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