Insight Medical Publishing
Journal of Clinical Nutrition & Dietetics
Journal of Clinical Nutrition & Dietetics
ISSN 2472-1921
2020
Vol.6 No.4

Association between obesity and autonomic nervous system activity in children

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Abstract

Introduction: Obesity is one of the most prevalent chronic diseases in childhood, being an important public health issue. Excess weight has been associated with autonomic dysfunction but the evidence in children is scarce. Therefore, this study aimed to assess the effect of overweight and obesity on the autonomic nervous system activity in children.

Methods: Data were collected from a cross sectional study including 916 children (7 to 12 years), from 20 primary schools in Porto, Portugal. Anthropometric measurements and bioelectrical impedance analysis were performed to assess body mass index (BMI) and characterize body composition - body fat percentage, body fat mass and total body water. BMI was classified according to age- and sex-specific percentiles defined by the World Health Organization, the US Centers for Disease Control and Prevention and the International Obesity Task Force. Pupillometry was performed to evaluate autonomic activity. Mann-Whitney, the chi-square, and Kruskall-Wallis tests were used as appropriate.

Results: Final analysis included 858 children, 50.6% boys, with a prevalence of obesity ranging between 7.5% and 16.2% according to the International Obesity Task Force and percentage of body fat criteria, respectively. The average dilation velocity was significantly higher among children with obesity, regardless of BMI criteria.

Conclusions: Our results suggest that obesity in children is associated with a dysautonomia in autonomic nervous system, namely with changes in sympathetic activity. Moreover, these findings provide support for the role of the autonomic nervous system in the interaction between lifestyle, diet and the BMI in children.

Biography:

Beatriz GT has completed her Undergraduate Degree at the age of 22 from the Faculty of Nutrition and Food Science of the University of Porto, Portugal. She has enrolled on the Clinical Nutrition master's degree at the same university in 2018. She is collaborating with the Basic and Clinic Immunology department of the St. John's Hospital Center, Porto, Portugal, in order to produce the present investigation. She has done 2 nutrition internships at the St. John's Hospital Center, Porto, Portugal, at the gastrointestinal surgery department. She has published an audio book related to food allergies (2016), available at https://elearning.up.pt/repositorio.

Speaker Publications:

1. FCNAUP. Livro digital "Receitas sem alergias", Faculdade de Ciências da Nutrição e Alimentação - Universidade do Porto, 2016. Available at: https://elearning.up.pt/repositorio

25th International Conference on Clinical Nutrition; Rome, Italy - March 02-03, 2020.

Abstract Citation:

Beatriz Gonçalves Teixeira, Association between obesity and autonomic nervous system activity in children, Clinical Nutrition 2020, 25th International Conference on Clinical Nutrition; Rome, Italy - March 02-03, 2020.

(https://clinicalnutrition.europeannualconferences.com/abstract/2020/association-between-obesity-and-autonomic-nervous-system-activity-in-children)