



## EDITORIAL COMMENT

# Obesity and hypertension in children – A growing problem<sup>☆</sup>



## A obesidade e a hipertensão arterial em idade pediátrica – a propósito de uma população em crescimento

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### Definition and epidemiology

European researchers define overweight as equal to or above the 85th percentile and obesity as above the 95th percentile of body mass index (BMI).<sup>1</sup> Although the Mediterranean diet has been awarded UNESCO intangible cultural heritage status, childhood obesity has such a high incidence in Portugal that it has become the sixth country in the European Union with a prevalence of overweight and obesity of over 30%. The World Health Organization (WHO) Regional Office for Europe has established the Childhood Obesity Surveillance Initiative (COSI)<sup>2</sup> in 15 European countries with the aim of regularly assessing trends in overweight and obesity among schoolchildren aged six to nine years (the annual meeting of this group was held in Lisbon last July).

This age-group is also the focus of the article by Frapporti et al. entitled “Cardiovascular risk factors in children” published in this issue of the *Journal*,<sup>3</sup> which included 709 schoolchildren. It is interesting to compare the results

obtained in Brazilian and European populations, notwithstanding certain methodological differences.

### Causes of childhood obesity and knowledge sources

The increased prevalence of obesity in children has been attributed to higher calorie intake (excessive consumption of sugar and fat, larger portions, and sweetened drinks) and a sustained decline in exercise. Obesity can affect children’s physical health, as well as their social and emotional well-being and self-esteem, and is associated with worse academic performance and self-reported quality of life.<sup>1</sup> Children and adolescents who are overweight or obese are likely to remain so in adulthood, a phenomenon known as tracking that is also seen with regard to hypertension in children. One of the main long-term epidemiological studies conducted in the US, the Bogalusa Heart Study,<sup>4</sup> reported

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that the descendants of adults with premature cardiovascular disease presented overweight in childhood and a high-risk metabolic profile (hyperglycemia and high total and low-density lipoprotein cholesterol levels analyzed separately and in combination).

Although there is no equivalent of the Framingham risk score or SCORE for children, there have been several longitudinal cohort studies in pediatric populations aimed at determining the importance of each conventional cardiovascular risk factor. One is the CARDIA study, which used the Pathobiological Determinants of Atherosclerosis in Youth risk score in a study population aged 15-34 years to predict coronary artery and abdominal aorta calcium in middle age.<sup>5</sup>

### Mechanisms behind hypertension and obesity in children

Once considered rare, primary hypertension in children has become increasingly common in association with obesity and other risk factors.<sup>1</sup> Obese children are three times more likely to present hypertension than non-obese children; the risk increases across the entire range of BMI values and is not defined by a simple threshold effect. The most important changes associated with childhood obesity are hypertension, insulin resistance, abnormalities in vascular structure and function (assessed at the subclinical stage by carotid intima-media thickness and left ventricular hypertrophy), dyslipidemia, nonalcoholic steatohepatitis, obstructive sleep apnea, orthopedic problems, and psychosocial problems.<sup>1</sup>

The Bogalusa Heart Study<sup>4</sup> reported that overweight children were more likely to present systolic and diastolic hypertension, a finding that the present study<sup>3</sup> corroborates.

### Underdiagnosis of hypertension in children

One of the main reasons for underdiagnosis of hypertension in children is how it is defined: blood pressure (BP) should be classified in percentiles according to gender, age and height, confirmed in at least two different assessments (above the 95th percentile being considered hypertension). There is no universal cut-off as in adults. In the study by Fraporti et al.<sup>3</sup> BP was measured only once using an automatic oscillometric device and those diagnosed with hypertension and/or obesity were referred to local health centers. The study reported a greater prevalence of high systolic BP in children living in urban areas, which is consistent with a more sedentary lifestyle and probably less healthy eating habits, although the relationship between BMI and hypertension in these children is not defined, which in itself could explain this finding.

### Socioeconomic factors

An article entitled "Cardiovascular health in Brazil: trends and perspectives",<sup>6</sup> published in January 2016, highlighted

the high degree of socioeconomic inequality and genetic diversity of a population of native Brazilian, European and African descent and the difficulties of the national health system in covering such a large and heterogeneous population. It reports that those of African descent with low socioeconomic status have high age-adjusted mortality, while cardiovascular events in other subgroups are now declining.

### Multidisciplinary approach and primary prevention

Following a diagnosis of obesity or hypertension, a program of lifestyle modification should be initiated that includes changes in diet and exercise levels, which should be prescribed on an individual basis and applied progressively.<sup>7</sup> The most effective programs adopt a multidisciplinary approach that includes psychological counseling on behavior modification and nutritional guidance. Drug therapy (metformin and antihypertensive agents) can subsequently be prescribed, without disregarding the importance of lifestyle modification.

The promotion of healthy lifestyles in terms of diet and regular exercise as early as possible is essential in order to maintain weight and adiposity within desirable limits. Measures should be introduced that are sustainable in the long term and appropriate to the socioeconomic and cultural contexts of the population, with cooperation between health institutions, consumer rights associations and the food industry.

### Conflicts of interest

The author has no conflicts of interest to declare.

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