



EDITORIAL

New elements in childhood obesity[☆]

Nuevos elementos en la obesidad infantil

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Obesity in children and adolescents is of particular relevance because it is very common, potentially extends into later life, and is associated to comorbidities such as arterial hypertension, hyperinsulinemia, dyslipidaemia, impaired physical condition, sleep disturbances, social limitations, and decreased quality of life.¹ If obesity perpetuates into adulthood, the risk of cardiometabolic disease increases, reducing life expectancy.¹ Childhood obesity is a great challenge for both society and the healthcare systems. According to data from the Aladino study conducted in 2010 and 2011 among children between 6 and 9 years of age and based on the World Health Organization (WHO) growth curves, the prevalence of overweight was 26.2% and that of obesity 18.3%.² A later study using the same methodology and published in 2015 reported a slightly lower prevalence of overweight (23.2%), while obesity showed virtually no change (18.1%).³ Knowing not only the extent of the problem but also the factors that favour excess weight is a priority concern, since it constitutes a starting point for defining possible interventions aimed at fighting obesity. The approach

to the problem of obesity requires better understanding of the critical periods for its development, in order to adopt preventive measures and establish the best management approach.

Although several studies have been carried out to identify the critical periods in the development of obesity, the pattern of weight gain during childhood implying sustained obesity is not clear, since the studies show great variability in terms of subject age, duration of follow-up and sample size. Relevant data have been obtained from a recent longitudinal study based on the general population and including 51,505 children, with observation starting at birth and up until 18 years of age.⁴ The study showed that overweight and obesity manifest early in life, and 75% of the children who were obese at three years of age remained obese in adolescence. Among the adolescents who were overweight or obese, the greatest acceleration in body mass index (BMI) occurred between 2 and 6 years of age. Even after this period of rapid weight gain, the BMI continued to increase, though at a lower rate. Of note is the fact that children born to obese mothers had a particularly high risk of suffering obesity, though the critical periods in the development of obesity were no different from those in children whose mothers were not obese. The patterns of change in BMI early in life, more than the absolute BMI value, may act as a predictor for identifying children at risk of developing adiposity in later stages.⁴

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The constant increase in obesity in developed countries shows that the classical dietary and nutritional, pharmacological and behavioural management approaches applied for decades have failed, and have been particularly ineffective in preventing obesity, as well as in maintaining lost weight. The management of overweight and obesity requires a multidisciplinary approach and is based on three key objectives: reorganization of eating habits, increased physical activity, and motivation of the child and family environment to achieve the necessary lifestyle changes, establishing acceptable goals that can be maintained over time. Drug treatment⁵ or bariatric surgery⁶ is still an exceptional indication in paediatric patients. The existing systematic reviews and meta-analyses on the different therapeutic options agree that it is presently not possible to establish specific recommendations in this respect, or to ascertain the long-term outcomes of such interventions. No proven treatments are yet available, and management individualization is required.

If treatment proves necessary, combined strategies involving diet, exercise and behavioural changes are the most effective option, particularly if the parents are implicated in the treatment. Such an individualized approach should include the assessment of cardiometabolic risk factors and the personalization of indicated treatment, especially as regards physical exercise.⁷ A parameter that may offer relevant information for the correct individualized planning of physical exercise is the cardiorespiratory capacity (CRC) of the child, as assessed by peak or maximum oxygen consumption (VO_2 peak) in the context of an exercise test. This is a particularly relevant parameter that constitutes a comprehensive measure of the functionality of the musculoskeletal, cardiocirculatory and metabolic components involved in physical activity and exercise.^{8,9} In this context, an adequate CRC implies a good coordinated physiological response of all of the aforementioned components and addresses a series of physical characteristics such as muscle strength and resistance, aerobic capacity, joint mobility, speed of movement, agility, coordination and balance.

Despite the limited number of studies, an association has been observed in children and adolescents between CRC and cardiometabolic alterations and an increased risk of cardiovascular disease. It has been shown that CRC, estimated on the basis of oxygen consumption (VO_2 peak) during an exercise test, is inversely correlated to baseline insulin and HOMA index, and provides an assessment of the degree of autonomic activation of the nervous system.⁹ These results agree with those of other studies conducted in young women,^{10,11} suggesting a relevant role of CRC as a potential predictor of future cardiometabolic alterations.

Along with the association studies, the *Amsterdam Growth and Health Longitudinal Study* found CRC during adolescence (between 13 and 16 years of age) to be related to the cardiovascular risk profile at 32 years of age. A

higher CRC grade was inversely associated to skin fold thickness, abdominal circumference and total cholesterol concentration.¹²

A better understanding of the factors and critical periods in the development of obesity, together with an individualized approach to management, are basic elements for containing the childhood obesity epidemic and its short- and long-term consequences. The early identification of risk in the first years of life should result in monitoring of the increase in BMI. Once overweight or obesity has started, accurate risk assessment may allow an adequate approach to the problem, thereby increasing the success rates.

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