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Obesity and hypertension in children and adolescents: a narrative review

Obesidade e hipertensão arterial em crianças e adolescentes: uma revisão narrativa

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ABSTRACT

One of the major public health problems today is overweight. Obesity is already known to be an important risk factor for several chronic noncommunicable diseases, which are allocated among endocrine-metabolic diseases, cardiovascular diseases, and neoplasms[1]. The World Health Organization released in its World Obesity Report 2022 a projection in which it estimates that by 2030 the world will go through an obesity epidemic and Brazil will have 7.7 million obese children, and it also estimates that about 23% of children aged 5 to 9 years and 18% of adolescents aged 10 to 19 years will be affected by this disease. Regarding cardiovascular diseases, arterial hypertension also constitutes one of the most important risk factors that induce these conditions. Currently, with the mandatory measurement of BP starting at three years of age or even earlier in the presence of risk factors for children, there is an increase in blood pressure levels in the pediatric age group, raising a warning sign for global health, since it can be a marker of the onset of target organ damage[3]. Overweight is a significant predictor of high BP in this population, besides obesity being a known important risk factor for the acquisition of cardiovascular diseases.

Keywords: Obesity, Hypertension, Children and Adolescents.

1 INTRODUCTION

One of the major public health problems today is overweight. Obesity is already known to be an important risk factor for several chronic noncommunicable diseases, which are allocated among endocrine-metabolic diseases, cardiovascular diseases, and neoplasms[1]. The World Health Organization released in its World Obesity Report 2022 a projection in which it estimates that by 2030 the world will go through an obesity epidemic and Brazil will have 7.7 million obese children, and it also estimates that about 23% of children aged 5 to 9 years and 18% of adolescents aged 10 to 19 years will be affected by this disease[2].

Regarding cardiovascular diseases, arterial hypertension also constitutes one of the most important risk factors that induce these conditions. Currently, with the mandatory measurement of BP starting at three years of age or even earlier in the presence of risk factors for children, there is an increase in blood pressure levels in the pediatric age group, raising a warning sign for global health, since it can be a marker of the onset of target organ damage[3]. Overweight is a significant predictor of high BP in this population, besides obesity being a known important risk factor for the acquisition of cardiovascular diseases[3].

2 OBJECTIVES

To analyze and describe the main aspects of obesity and hypertension in children and adolescents.

3 METHODS

This is a narrative review, in which was the main aspects of obesity and hypertension in children and adolescents. The study was started with theoretical training using the following databases: PubMed, sciELO and Medline, using as descriptors: "obesity" AND "hypertension" AND "teeneger" AND "metabolic syndrome" AND "epidemiology" in the last 10 years.

4 RESULTS AND DISCUSSION

Obesity is a growing problem in childhood and deserves due attention, since it is known that visceral adiposity is associated with dyslipidemia, hypertension, and changes in glucose metabolism[3]. As for the pathogenesis, the participation of inflammatory phenomena and oxidative stress is inherent. Lifestyle modification, with the abolition of sedentary lifestyles, has clear significant improvements in the individual's metabolic and inflammatory profile, and the risk of hypertension is higher in children with lower levels of physical activity[4] .

The increasing prevalence of obesity in the pediatric population is related to both the increase in caloric and fat intake and the decrease or absence of physical activity in this population. This problem is aggravated by the fact that overweight and obese children and adolescents are more likely to remain obese into adulthood[5] . Hypertension is underdiagnosed in the pediatric population, because the elevation of blood pressure in this age group is classified in percentiles according to age, sex and height, without a universal value for classification as in the case of adults.[5]

A longitudinal study that followed 469 children and adolescents aged 7 to 17 years for 3 years showed an incidence of hypertension of 11.5%, and obese individuals were more likely to become hypertensive (OR: 4.84; 95% CI: 1.57-14.95)[6] . Another cross-sectional study, conducted with 709 children aged 6 to 9 years in a city in southern Brazil, between the years 2012 and 2013, found a direct relationship between obesity and hypertension, because as BMI and waist circumference increased, the means of SBP and DBP tended to increase as well[3]. In Portugal, a cross-sectional study by Melo Rodrigues et al. including 1555 children aged 6-9 years, recruited in public and private schools between 2009 and 2010 concluded that overweight can predict the

onset of high blood pressure, and a prevalence of normal-high blood pressure was found in 4.5% and hypertension in 3.7% of children. [7]

In a medium-sized municipality in Brazil, Lima et al. conducted a cross-sectional study with 670 adolescents, aged between 10 and 19 years, in 2015. It was observed 15.1% of adolescents with overweight, 12.3% with obesity, and 1.8% with high abdominal circumference. Elevation of blood pressure levels was attested in 20.4% of participants, and a significant association of high blood pressure was found in overweight adolescents (OR 3.00; CI 85-4.86)[8].

Similar results were also found in another study, this time analyzing 817 children between 10 and 13 years of age in 2014, being found high blood pressure in 7.3% of children and a strong association between the presence of overweight and the occurrence of high blood pressure levels, regardless of the criteria used ($p < 0.001$)[9]. The results found in the studies brought by this review show the relevance of this issue. Obese children present three times more risk to present hypertension than non-obese children, and the risk increases with the progressive increase in BMI. [10]

5 CONCLUSION

Obesity, a growing public health problem, constitutes a risk factor and coexists with several comorbidities, worsening its condition. Globally, childhood diseases are studied, seeking to understand their pathophysiology as well as the factors involved in their genesis and maintenance, in order to apply more effective health promotion and disease prevention measures. Hypertension, also a growing public health problem around the world, has its incidence and prevalence increased, even in early age groups.

In this context, an association between obesity and hypertension in children and adolescents is increasingly being observed, presenting a bidirectional relationship that should be carefully studied, aiming to understand the mechanisms involved in its relationship to establish effective measures in the management of these conditions, not only curatively, but also preventively, to improve the quality of life of these people, avoiding current and future complications.

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