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Obesity: a puzzling disorder

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To a certain extent, we may say that the history of humankind has been characterized by struggles against hunger. However, there have been reports and depictions of obese persons since ancient times. In some societies, and even in western societies, in some periods, obesity used to be a sign of good health and beauty. As an example, we have the famous paintings of Flemish and Impressionist artists portraying men and women bearing weights (metaphorically speaking) far greater than those seen as beautiful and appropriate for today's standards.

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After the mid-20th century, some evidence began accumulating that obesity could be deleterious to people's health. Today, it is clearly established that obesity increases the risks for hypertension, type 2 diabetes, and cardiovascular diseases. Although obesity was found to be harmful to health, humankind has witnessed an increase in its prevalence in the last 50 years, being regarded by the World Health Organization as a global epidemic.[1] Some years later, albeit less intensely, we have noted that the prevalence of obesity has been increasing among children and adolescents, in industrialized and developing countries.[2] In Brazil, while malnutrition decreased, obesity started to increase.[3]

Even though not all obese adults were obese as a child, it is well established that obese children and adolescents, especially after the age of five years will be obese adults.[4] Nevertheless, several obesity-related problems that used to be characteristic of adulthood are now observed in childhood and especially in adolescence. Obesity-related metabolic disorders are already observed in children. Hypertension, hypercholesterolemia and hyperinsulinism are found in children and adolescents, resulting in cardiovascular diseases and diabetes. Other diseases have been described in obese children: dyslipidemia, tibia vara, insulin resistance, polycystic ovarian syndrome, gallstones, hepatic steatosis, sleep apnea, among others, in addition to the prejudice to which these children are exposed at school and in their neighborhood, where they may be seen as lazy persons, gluttons, and liars.[5]

In an attempt to find out why obesity has suddenly become a major problem, researchers have sought answers in the most varied fields, sometimes arriving at conflicting findings, going from molecular biology to epidemiological studies, from psychological, social, and clinical studies to the theory of evolution.[6] As if they tried to solve a puzzle, without the slightest idea of what it will be like after all pieces have fallen into place, some authors discuss and investigate genetic influence, while others examine hormones and regulators of lipid metabolism and satiety (leptin, adiponectin, grelin, pYY), gene mutations, and yet some others investigate into physical activity, kinds of foods, and interactions between them, influence of birthweight, television viewing time and so on and so forth.[7]

Based on this multi-faceted insight, the current issue of *Jornal de Pediatria* publishes three articles on different aspects of obesity.[8-10]

The article written by Balaban and Silva (2004)[8] is concerned with the probable protective effect of breastfeeding against childhood obesity. The hypothesis that breastmilk may protect against obesity is quite appealing, given the several benefits that breastfeeding may bring to the child and mother. The authors initially review the biological factors implicated in energy balance regulation, discuss the multiple causes of obesity, review some epidemiological studies that seek to find an association between breastfeeding and protection against obesity, and finally, they discuss the theory of metabolic imprinting, which explains why breastmilk can have this protective property. The authors conclude that breastfeeding "seems" (quotation marks are mine) to protect against childhood obesity, but this issue has to be further investigated. In fact, there is some ambiguity in this conclusion. In a review published in 2001,[11] the author concludes that studies have yielded controversial results. A prospective study conducted in Brazil, which has been recently

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published,[12] has not reported any protective effect of breastfeeding against obesity. An English study[13] was published in the same issue in which the Brazilian study was released, and has not shown any protective effect either. The nonexistence of a protective effect does not invalidate the importance of breastfeeding for the health of children and adolescents. However, breastfeeding should not be seen as the solution to every health problem, since this attitude may downplay its importance.

The article written by Giugliano and Carneiro (2004)[9] investigates some obesity-related factors in middle and upper-middle class students of a school in Taguatinga (DF). The authors conducted an anthropometric assessment of 452 students aged between 6 and 10 years, selected 68 overweight and obese children and 97 normal-weight children, and applied a questionnaire about their physical activity, daily amount of sleep, and parental education, physical activity, weight and height. The prevalence of overweight was 16.8% and that of obesity was 5.3%. It is not as high a prevalence as that reported in the literature. Two other findings seem very interesting. The first one refers to an inverse correlation between sleep and adiposity, and a direct correlation with the time spent sitting, observed among overweight and obese children. The role of sleep is also discussed, without relating it to physical activity. Could a more intense physical activity contribute to sleep? Would it not be better to encourage physical activity instead of stimulating sleep, as suggested by the authors? Another highlight of this study concerns the percentage of obese and overweight parents. Although this percentage is high among obese and overweight children (75%), it is also high among normal-weight children (50.6%).

The article by Lima et al.[10] investigates the lipid profile and peroxidation in the plasma of obese children and adolescents, whose overweight and weight are within the normal values for both genders. Both male and female overweight and obese individuals showed abnormal parameters, but males were more affected. This study suggests that obesity may be more detrimental to male children and adolescents.

Even though several pieces of the puzzle have not fallen into place yet, the following has been confirmed: body weight is regulated by several mechanisms that seek to maintain the balance between energy intake and energy expenditure, and these mechanisms are very accurate under normal conditions. Any factor that interferes with these mechanisms, causing an increase in energy intake and a decrease in energy expenditure, may lead to obesity in the long term. The rampant increase in obesity in the last few years among ethnically similar populations, living in different environmental conditions but with different prevalence rates, shows the key role environment plays in the etiology of obesity, although genetic factors might be implicated, especially when individual susceptibility is concerned.

Most of molecular biology studies are aimed at finding some kind of drug to treat obesity without causing any side effect. So far, such drug has not been found, and recently used drugs have yielded frustrating results.[14]

It is common sense that obesity treatment is not an easy task, and quite often, individuals who manage to lose weight put it back on some time later. This is true, but we have overlooked the influence of environmental factors over the increased incidence of obesity (sedentary lifestyle, characterized by the time spent in front of TV, computer and videogame, and lack of space for leisure activities, combined with the easy access to carbohydrate-rich and fat-rich foods), in addition to food marketing in the mass media. Usually, issues related to obesity, its clinical consequences and ways to solve it are only brought up when patients seek medical care, and in most cases, obesity is not the key problem. Medical treatment is important, but without being environmentally stimulated, children, adolescents, or even adults, will not be able to overcome obesity. I am not talking about family environment, but about society as a whole. To conclude with, in my opinion, medical associations should sensitize the government about the necessity for consciousness-raising campaigns to make people aware of the importance of a good-quality diet and daily physical activity. This should not be an individualized approach, but a social one. People have to find some time for physical activity, both at work and at schools. Foods that are rich in calories and poor in nutrients should not be sold at schools or advertised in the mass media. People should know that eating is a healthy and pleasant activity, but that it is not risk-free, that is, they should not think that they could eat *ad libitum* and then solve any resulting problems by taking a heartburn medicine.

References

1. World Health Organization. Obesity: preventing and managing the global epidemic. Report of a WHO Expert Consultation on Obesity. Geneva, 3-5 June, 1997 (WHO/NUT/NCD/97.2). Geneva: WHO, 1998.
2. Styne DM. Childhood and adolescent obesity: prevalence and significance. Ped Clin N Am. 2001;48:823-54.
3. Wang Y, Monteiro CA, Popkin BM. Trends of obesity and underweight in older children and adolescents in the United States, Brazil, China, and Russia. Am J Clin Nutr. 2002;75: 971-7.
4. James WPT. Tendências globais da obesidade infantil – Conseqüências a longo prazo. Anais Nestlé. 2002;62:1-11.
5. Strauss RS. Childhood obesity. Ped Clin N Am. 2002;49:175-201.
6. Friedman JM. A war on obesity, not the obese. Science. 2003;299:856-8.
7. Ebbeling CB, Pawlak DB, Ludwig DS. Childhood obesity: public-health crisis, common sense cure. Lancet. 2002;360:473-82.
8. Balaban G, Silva GAP. Efeito protetor do ale*itamento m*aterno contra a obesidade infantil. J Pediatr (Rio J). 2004;80:7-16.
9. Giugliano R, Carneiro EC. Fatores associados à obesidade em escolares. J Pediatr (Rio J). 2004;80:17-22.
10. Lima SCVC, Arrais RF, Almeida MG, Souza ZM, Pedrosa LFC. Perfil lipídico e peroxidação de lipídeos em crianças e adolescentes com sobrepeso e obesidade. J Pediatr (Rio J). 2004;80:23-8.

11. Butte NF. The role of breastfeeding in obesity. Ped Clin N Am. 2001;48:189-98.
12. Victora CG, Barros FC, Lima RC, Horta BL, Wells J. Anthropometry and body composition of 18 year old men according to duration of breast feeding: birth cohort study from Brazil. BMJ. 2003;327:901-5.
13. Li L, Parsons TJ, Power C. Breast feeding and obesity in childhood: cross sectional study. BMJ. 2003;327:904-5.
14. Pi-Sunyer X. A clinical view of the obesity problem. Science. 2003;299:859-60.

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