





Epidemiological and Clinical Characteristics of Pediatric and Adolescent Obesity Enrolled in a Tertiary Referral Center

Características clínicas e epidemiológicas de crianças e adolescentes atendidos em um centro de referência terciário

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Abstract

Objective To describe some demographic, clinical and laboratory characteristics of obese children and adolescents admitted in an obesity ambulatory of a referral center located in the southeastern region of Brazil.

Methods This is a cross-sectional and observational study and the data (age, gender, type of delivery, birthweight, age of birth, breastfeeding, laboratory tests and maternal body mass index [BMI]) were collected from medical records.

Results The study included 89 patients, of which 45 (50.6%) were male. The mean age was 68.9 months, 50 (55.6%) were first-born, 51 (57.3%) were exclusively breastfed during the 1st 6 months of life, and 18 (20.1%) did not receive breast milk. The mean age of the mothers was 29 years old, 87 (98%) did prenatal assistance, and 69 (77.6%) had a BMI > 25 kg/m². The results also showed that cesarean delivery (42.6%), low birthweight (6.7%), prematurity (8.7%) and early introduction of artificial food (20.1%) was not predominant among the patients. A total of 25 (28%) subjects had total cholesterol > 170 mg/dL, 35 (39.3%) with LDL-cholesterol > 110 mg/dL, 34 (38.2%) had HDL-cholesterol < 40 mg/dL, and 6 (6.7%) with triglycerides > 130 mg/dL. All of the patients had at least one altered biochemical test.

Conclusion Healthy lifestyle promotion should be included in every pediatric primary care program, and all children should receive counseling about healthy nutrition and physical activity since birth. Reducing childhood obesity is a major public health priority and primary prevention programs are a critical part to address the problem.

Keywords

- ▶ obesity
- ▶ overweight
- ▶ child care
- ▶ chronic disease

Resumo

Objetivo Descrever algumas características demográficas, clínicas e laboratoriais de crianças e adolescentes obesos atendidos em um ambulatório de obesidade de um centro de referência localizado na região sudeste do Brasil.

Métodos Trata-se de um estudo transversal e observacional que utilizou dados (idade, sexo, tipo de parto, peso ao nascer, idade de nascimento, aleitamento materno, exames laboratoriais e IMC materno) coletados de prontuários médicos.

Resultados O estudo incluiu 89 pacientes, 45 (50,6%) eram do sexo masculino. A idade média foi de 68,9 meses, 50 (55,6%) primogênitos, 51 (57,3%) amamentaram exclusivamente durante os primeiros seis meses de vida e 18 (20,1%) não receberam leite materno. A idade média das mães foi de 29 anos, 87 (98%) fizeram Pré-natal e 69 (77,6%) tinham IMC > 25 kg/m². Os resultados também mostraram que o parto cesáreo (42,6%), baixo peso ao nascer (6,7%), prematuridade (8,7%) e introdução precoce de alimentos artificiais (20,1%) não foram predominantes entre os pacientes. 25 (28%) indivíduos tinham colesterol total > 170 mg/dL, 35 (39,3%) com colesterol LDL > 110 mg dL, 34 (38,2%) tinham colesterol HDL 130 mg/dL. Todos os pacientes tiveram pelo menos um teste bioquímico alterado.

Palavras-chave

- ▶ obesidade
- ▶ excesso de peso
- ▶ assistência à infância
- ▶ doença crônica

Conclusão A promoção do estilo de vida saudável deve ser incluída em todos os programas de Atenção Primária pediátrica e todas as crianças devem receber aconselhamento sobre nutrição saudável e atividade física desde o nascimento. Reduzir a obesidade infantil é uma das principais prioridades de saúde pública e o programa de prevenção primária é uma parte crítica para resolver o problema.

Introduction

Obesity is an epidemic and complex disorder whose prevalence has increased significantly to the point that many consider it a major health concern of the developed world. Globally, estimates show that 41 million children < 5 years old are affected by overweight and obesity.¹ In the United States, there are between 21 and 24% of children and adolescents overweight, and between 16 and 18% obese.^{2,3} Among preschool children aged 2 to 5 years old, a notable increase in obesity prevalence occurred in 2015/2016.^{3,4} In Japan, the prevalence of childhood obesity is increasing since the 1970s while, in France, obesity increased significantly from 2009 to 2013, and it is estimated that by 2020 the prevalence of overweight should affect > 9% of the child population of the world.⁵

This problem also affects the developing countries, including the Brazilian pediatric population where, between 2008 and 2009, the excess of weight reached 33.5% of children from 5 to 9 years old and a prevalence of 16.6% and 11.8% of obesity was observed in boys and girls, respectively.⁶

Due to the association with various factors (biological, environmental, genetics, sociodemographic, among others) the difficulty in reversing obesity once it is established, and the subsequent associated morbidity and mortality, has become a problem of difficult solution, since obesity in childhood has various adverse effects like cardiovascular risk, type 2 diabetes, high level of lipids, blood pressure, and insulin, metabolic syndrome, lower physical fitness and poor quality of life,⁷ and it also has a decisive impact on health in adulthood, increasing the risk of chronic noncommunicable diseases and

disabilities.⁸ Several studies have reported that children who are obese have an increased risk of remaining overweight or obese in adulthood with increased cardiac and metabolic risk.⁹⁻¹² It is well-established that children who are overweight or obese at 2 years old are more likely to be overweight during adolescence and in adult life.^{10,12}

The methods used to directly measure body fat are not available in daily practice. Therefore, for children and teens, overweight and obesity can be determined by body mass index (BMI), which is an anthropometric measure. Because the body composition of children varies according to age and between boys and girls, overweight is defined as a BMI \geq 85th percentile and < 95th percentile for children and teens of the same age and gender, while obesity is defined as a BMI \geq 95th percentile for children and teens of the same age and gender.¹³ The knowledge of the characteristics of obese children is very important for accurate follow-up and to evaluate the effectiveness of public health programmes.⁵ In this context, the aim of the present paper is to describe some demographic, clinical and laboratory characteristics of obese children and adolescents from the age range of 1 month to 15 years old admitted in an obesity ambulatory of a referral center located in the southeastern region of Brazil.

Material and Methods

This is a cross-sectional and observational study and the data were collected from medical records of pediatric and adolescent patients at the admission in an ambulatory referral center located in the southeastern region of Brazil. The patients were referred from several primary care services

and the inclusion criteria were subjects aged 1 month to 15 years old, considered obese and/or overweight. To characterize the age range of adolescence, the criterion adopted by the World Health Organization was used, that is, individuals aged 10 to 20 incomplete years old.¹⁴

The variables studied were gender, birthweight (low birthweight < 2,500 g and high birthweight > 4,000 g), weight (g) and length (m) at first attendance, weight (g) and length (m) of the mother. Some biochemical tests like serum level of blood glucose (g/dL), total cholesterol (reference value [RV] < 150 mg/dL), HDL (RV > 45 mg/dL), LDL (< 100 mg/dL) and triglycerides (< 100 mg/dL) were also studied.¹⁵

The BMI of the mothers was calculated by the formula: BMI = weight (kg)/height (m²) and stipulated as cutoffs of adult BMI (≥ 25 to < 30 overweight and obese ≥ 30).¹⁶

Data are presented as means and standard deviation (SD) for continuous variables and percentages for categorical variables. The significance level was $p < 0.05$ and data were analyzed using the statistical software Epi info 7 (Centers for Disease Control and Prevention, Atlanta, GA, USA). The present study was approved by the Research Ethics Committee of the Hospital das Clínicas of the Faculty of Medicine of the Universidade de São Paulo.

Results

The study included 89 patients, of whom 45 (50.6%) were male. The mean age was 68.9 months, 50 (55.6%) were firstborns, 51 (57.3%) were exclusively breastfed during the 1st 6 months of life, and 18 (20.1%) did not receive breast milk.

The average age of the patients, with minimum and maximum limits, is presented in ►Table 1. The mean age of the mothers was 29 years old, 87 (98%) did prenatal assistance, and 69 (77.6%) had BMI > 25 kg/m². Other characteristics of the subjects are presented in ►Table 2.

The results of the biochemical profile of the patients can be found in ►Table 3. According to the reference values for the variables studied, 25 (28%) subjects had total cholesterol > 170 mg/dL, 35 (39.3%) with LDL-cholesterol > 110 mg/dL, 34 (38.2%) had HDL-cholesterol < 40 mg/dL, and 6 (6.7%) with triglycerides > 130 mg/dL. All of the patients had at least one altered biochemical test.

Discussion

Researchers show that many factors are associated with childhood obesity. Among them can be highlighted: infant feeding, use of food for nonnutritional purposes, parenting style and modeling, family lifestyle, exposure to television and disordered sleep.¹⁷

Table 1 Age distribution of 89 patients

Age (years old)	min	mean	SD	max
< 10	16	58.6	29.1	115
≥ 10	125	142.6	15.0	169

Abbreviations: Min, minimum; max, maximum; SD, standard deviation.

Table 2 Distribution of some characteristics of 89 patients

	n	%
Gender		
Male	45	50.6
Female	44	49.4
Type of delivery		
Normal	51	57.3
Cesarean	38	42.6
Birthweight (g)		
< 2,500	6	6.7
2,500–2,999	13	14.6
3,000–4,199	62	69.1
< 4,200	8	9.6
Age of birth (week)		
< 37	8	8.7
37–52	81	91.3
Exclusive breastfeeding duration (months)		
none	18	20.1
< 6	20	22.5
≥ 6	51	57.4

Table 3 Distribution of the results of laboratorial tests of 89 patients

Age (years old)	< 10		≥ 10	
	mean	SD	mean	SD
Glucose (g/dL)	79.5	5.86	96.7	6.10
Total cholesterol (mg/dL)	154.1	22.37	172.3	16.27
HDL cholesterol (mg/dL)	47.8	6.21	41.2	5.90
LDL cholesterol (mg/dL)	96.4	8.93	108.6	9.78
Triglyceride (mg/dL)	78.2	6.14	119.2	12.10

Abbreviation: SD, standard deviation.

In the present study the results showed that cesarean delivery (4.6%), low birthweight (6.7%), prematurity (8.7%) and early introduction of artificial food (20.1%) were not predominant among the patients. On the other hand, the means of the laboratory tests found elevated levels of total and LDL-cholesterol. Therefore, these patients had marked obesity, but without some determinants of obesity present in a country undergoing nutrition transition.

Among the 89 children included in the study, 13 (14.6%) were < 2 years old, that is, they were still experiencing a high growth and weight gain stage, when the diet should be adequate and the eating habits are being incorporated. The majority of children (64.5%) were in the preschool age group, which is less present in childcare follow-up programs, losing opportunities for early detection and intervention.¹⁸

Early weaning and subsequent introduction of solid foods on infant feeding practices have been identified as one of the

main factors that may contribute to childhood obesity.^{19,20} It has been observed that the maximum benefits of breastfeeding are obtained when its duration is longer than 6 months and when it extends for 2 years, complemented with other adequate foodstuffs.²¹ Healthy dietary habits need to be a keystone of family life.

Interventions in early life, when biology is most amenable to change, are more likely to have sustained effects on health because obesity-related behaviors are established in early childhood and rapid growth in the first 2 years of life.²² Maternal BMI showed that only 22.4% of the mothers were not overweight or obese. Several studies have been published pointing the relationship between the nutritional status of the mother and her children and highlighting that children of obese mothers are more likely to be obese.²³

Parents generally tend to underestimate their overweight or the weight of their obese child, which complicates the involvement in all aspects related to the prevention and treatment of obesity in children.²⁴ Healthy dietary habits need to be a keystone of family life. It is important that they understand the weight status of their child because with an accurate perception they are more likely to modify behaviors.^{25,26}

Early detection of overweight is essential, and routine evaluation of children in their first years is required, which is an ideal time to initiate follow-up programs, because the precocious diagnosis and the perception of the tendency of excessive weight gain may be more quickly addressed.²⁷

Conclusion

Healthy lifestyle promotion should be included in every pediatric primary care program, and all children should receive counseling about healthy nutrition and physical activity since birth.³ Reducing childhood obesity is a major public health priority and primary prevention programs are a critical part to address the problem.²⁸ To that end, it is necessary to involve all sectors of society such as pediatricians, families, teachers and public authorities to make efforts to enable primary prevention activities in obesity,²⁹ avoiding missed opportunities to identify children with overweight and obesity.

A basic combination of adequate dietary habits and physical activity should be the starting point for prevention and controlling childhood obesity. For this, it is necessary to include parents as agents of changes, influencing children through modeling and supporting healthy behaviors, monitoring eating and activities, and reducing unhealthy for consumption.^{30,31}

Pediatricians are responsible for identifying children at risk of developing obesity by monitoring weight, height, BMI, dietary and sedentary habits acting as a defender of the child, because they are in position to interact with patients and families and, also as a citizen, who can act together with the objective of implanting recreation centers and environmental changes that facilitate the practice of physical activities to reduce sedentary lifestyle.^{1,32}

The present article presents some weaknesses such as the small number of patients and the impossibility of

comparative analyzes between the different age groups and genders. However, the dissemination of these results and the discussion can contribute to the fact that the theme is always relevant and can stimulate new research that contributes to the quality of life of overweight children and adolescents.

Conflict of Interests

The author has no conflict of interests to declare.

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