115 - OBESITY AND MOTOR DEVELOPMENT - A CROSS-SECTIONAL STUDY WITH BRAZILIANS SCHOOL CHILDREN

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INTRODUCTION

The motor development is continues it alteration in the behavior of the being throughout the cycle of the life, carried through for the interaction enters the necessities of the biological task and the conditions of the environment where if it finds the individual (GALLAHUE, 2001).

The successive integration of the motor development implies in the constant and permanent organic maturation. The movement and your purpose represent a unit that goes to improve each time more, as resulted of a progressive differentiation of the integrate structures of the human (ROSA NETO, 2002).

The beginning of the formal school period constitutes an important change in the physical development of the child. The school means the start of the period where this will have to learn all the specific abilities that are part of its culture (BEE, 1997).

It sufficiently clearly seems that the children are active and make many physical activities daily, however to live in the city, to live in apartment and to enjoy of the TV they are factors that have created sedentary lifestyle for many of these children.

The inactivity without doubt is one of the great causes of the increase in body weight which had to the disequilibrium in the energy balance, leading to the obesity (STEINBECK, 2001)

Obesity is the excess of body fat in the total body weight of the individual. It is determined by the adipose tissue percentage that the individual own (BOUCHARD, 2003).

Epidemiological data show that prevalence rates are increasing and that the obesity in childhood is taking ratio epidemic (ASSIS et al., 2005). In world approximately 22 million children of 5 years has overweight. This data are alarming, mainly because esteem that 80% of the obese children become adult obese (WATTS et al., 2005).

Moreover, the obesity in the adolescence predicts a series of adverse effect to the health in the adult life. The overweight and the obesity in childhood have been related with diverse factors of risk as the cardiovascular illnesses, hypertension, diabetes, minor plasmatic cholesterol concentration of high density (HDL), psychological disorders, apoplexy, and still motor difficulties (BOUCHARD, 2003).

Another consequence of the obesity is body scheme disorders, that are characterized by disturbs in the identification of the measures and body functions, and is related to the psychomotor development. Thus, an important characteristic in obese is, generally, the depreciation of the proper physical image, demarcated for the unreliability in relation to the others (CONTI et al, 2005).

Parísková (1982) had called the attention for the fact of that a frequent characteristic in the obese child is the reduction of the physical activity and the lack of interest for the exercise.

It seems that the obese child when participates of a game or exercise, its activity is smallest than a child with normal weight under the same conditions. For the obese child the physical activity represents a greater effort, and this reduces the pleasure of the activity (MAYER, 1970 apud PARÍSKOVÄ, 1982).

Thus, a question that is the target of this study is the relation between obesity and motor development of school children.

Method

The population of the present study was composed for school children of 6 the 10 years (1 to 4ªgrade) of both the sexes, registered in schools of São José, Santa Catarina, Brazil. For the composition of the sample three schools had been selected, a school of the central region and two schools of periphery, totalizing 2559 children registered the evaluated schools. First, height and body weight was evaluated, being selected for the motor evaluation 212 obese school children (8.28%). These, 10.43% are of central region school (1) () and 6.67% of the periphery schools (2 and 3). But 194 of the 212 children had received assent from the parents to participate of the research, 101 female and 93 male. To classify the obese children was used the percentile 90 for body mass index in every age (BMI/Age), recommended for evaluation of different racial groups and for international use (ROBERTS and DALLAL, 2001), being the same adopted for the Health Department of Brazil (VASCONCELOS, 2000). It was assumed as inclusion criterion the children with values above of percentage 90 of relation BMI/age.

The instruments used were stadiometer with precision of 0.1 m and scale with precision of 0.1 kg. For the evaluation of the motor development the tests had been used that compose the Scale of Motor Development (EDM) (ROSA NETO, 2001). The variable analyzed had been: Chronological Age (IC); General Motor Age (IMG); Fine Motor Development (IM1); Global Motor Development (IM2); Balance (IM3); Body Scheme (IM4); Space Organization (IM5); Temporal Organization (IM6); General Motor Quotient (QMG); Fine Motor Development Quotient (QM1); Global Motor Development Quotient (QM2); Balance Quotient (QM3); Body Scheme Quotient (QM4); Space Organization Quotient (QM5); Temporal Organization Quotient (QM6).

RESULTS

The table 1 show the data of the motor development where we can verify a delay in motor development areas relationship the chronological age, with greater deficit in the balance, space organization and temporal organization. No significant difference were found between the sexes ($p<0,05$).

Table 1 Referent data to motor development of obese school children (n=194)

Variables (months)	Mean	SD	Minimum	Maximum
Chronological Age	105.00	14.18	78.00	132.00
General Motor Age	84.26	12.68	52.00	118.00
Fine Motor Development	84.83	14.16	36.00	132.00
Global Motor Development	90.59	20.58	36.00	132.00
Balance	84.19	21.63	36.00	132.00
Body Scheme	85.61	19.01	36.00	132.00
Spacial Organization	80.97	22.63	36.00	132.00
Temporal Organization	79.42	18.71	48.00	132.00
General Motor Quotiente	80.66	10.19	57.00	114.00
Fine Motor Development Quotient	81.66	13.72	38.00	143.00
Global Motor Development Quotient	86.45	17.73	45.00	131.00
Balance Quotient	80.45	19.27	41.00	148.00
Body Scheme Quotient	81.63	15.95	39.00	122.00
Spacial Organization Quotient	77.13	20.12	35.00	165.00
Temporal Organization Quotient	76.49	19.10	45.00	165.00

In figure 1, it can be observed the frequency and the percentage of the general motor evaluation. These data confirm the analyzed in table 1, therefore 36.6% present a level of normal development low e 32.5% inferior thus showing a delay in the development of the obese children. No have difference in the general motor evaluation in both sexes (p<0, 05)

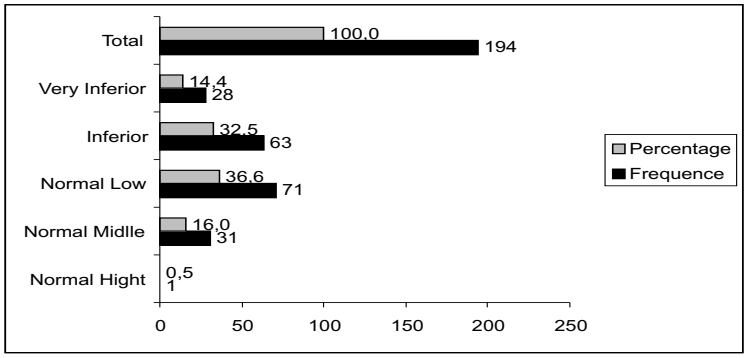

Figure 1 Classification of the General Motor Evaluation of the obese school children

The predominant laterally in this population is the complete right (61% girls and 47% boys), but a significant percentage of the population presents its crossed laterally (29% girls and 43% boys)

DISCUSSION

The motor development comes being used to understand the development human, since the birth until the end of the adult life. According to Rosa Neto (2002), the human organism have a biological logic, a maturational and evolution organization, a door opened for the interaction and stimulation since the moment of the conception, passing for the moment of the birth and the successive evolutions. The development is influenced by intrinsic and extrinsic factors. The environment where we live, the feeding, the space for the games and tricks, the chance of socialization and the formal education through the school constitute elements that will participate of the child development.

In the table 1, the average of all the group in Chronological Age (IC) is 105,00 months and its General Motor Age (IMG) is of 84,26 months, presenting a difference of 24,74 months. The areas with more deficits are Temporal Organization (25,58 months below of the IC), the Space Organization (24,03 months) and the Balance (20.81 months). Comparing with the study of Rosa Neto (1996), carried through with 75 normal children of 6 the 10 years, 1 to 4 grade in schools of the Seville and Zaragoza (Spain) this it got one IC of 96,0 months and a IMG of 94,4 months a difference of 1,6 months. Observing both studies, the children of the present study demonstrate a motor deficit accented when comparing with the children of the study of Rosa Neto (1996).

Batistella (2001) analyzing normal children of 6 the 10 years of the Cruz Alta, Rio Grande Do Sul (Brazil) got one IC of 100,09 months and a IMG of 94,35 months, a difference of 5,75 months; comparing with that children, the obese children of this study show delay in motor development's.

This delay can be caused for inactivity associated with the obesity, difficulty for make of activities, shame of the exposition of its body appearance. This care for not exposing itself provides to obese the choice of activities with below energy expenditure. Many young obese do not support the feeling of exclusion in its daily activities and finish many times for abandoning healthful habits of life and that generally in this age, it is many times related with the games and in groups. Thus, on the contrary of this child to be participating of sports schools and activities as camping, these children make activities in house, as play videogame, to see television, talking in chat rooms saw internet, among others activities that they do not make possible deeply ample motor, limiting the motor development that are latent in this period of life, and that they need to be stimulated.

Comparing the variable IC, IMG, IM1, IM2, IM3, IM4, IM5 and IM6 (Table 2) of the present study with other studies, can to verify that in none of the analyzed areas of motor development the obese children had gotten superior performance in relation the its chronological age, just children with greater chronological age average.

Table 2 Comparison between the present study (obese school children) and others studies in literature (with normal children)

Variables (months)	Schoolchildren whith obesity	Cuz Altaÿs Schoolchildren	Sevilha and Saragozaÿs Schoolchildren
	Mean	*Mean*	*Mean*
Chronological Age	106.43	100.09	96.0
General Motor Age	84.67	94.35	94.4
Fine Motor Development	85.55	100.17	96.4
Global Motor Development	90.84	103.86	94.1
Balance	83.16	103.44	78.9
Body Scheme	86.19	98.04	97.4
Spacial Organization	80.77	85.81	88.8
Temporal Organization	81.48	74.82	80.0

Considering these results it is verified that in none of the index of motor development the obese children had it's they go beyond its IC. These results indicate one general delay in motor development of the obese school children.

The data of figure 1 confirm the result of table 1 where 36.6% of the obese children had been classified with a normal low motor development and 32.5% with normal inferior motor development adding a total of 69,1% of the searched population. 14.4% showed very inferior motor development.

In a study carried through for Rodrigues (2000) with school children of Florianopolis, Santa Catarina, of 106 searched children, 61.3% they had gotten normal medium motor development and none showed very inferior motor development.

Batistella (2001) verified 67.0% with normal motor development and none with very inferior motor development and Rosa Neto (1996) show 72.6% of the children with normal medium motor development and none very inferior.

Comparing three studies (BATISTELLA, 2001, ROSA NETO, 1996; and this study), with school children of the same age, we can verify that the obese children present a low level of motor development.

Some motor standards are directly related with children and adolescents obese, such as: hypo-activity; heavier work to carry through a certain level of exercise; low efficiency mechanics; greater energy expenditure for specific effort; different metabolic and hormonal process of the eutrofic children (PRATI and PETROSKI , 2001)

In relation to the laterality, according to Guillarme (1983), the child has its laterality established between the 6-7 years, where the prevalence of one of the sides is entirely on the multiple and combined factors. The one of the sides fortify and predominance of this, are very important for the child. Therefore it constitutes the baseline of space organization and general coordination. It is during the growth and the acquisition of experiences inside of the social environment that the dominance of the laterality is defined (GALLARDO, 1997). She can yourself be said that the two hemispheres function complementarily and not separately having an one of them paper particular of what the other (COSTE, 1981).

In the population this study, 54.6% has laterality complete right and 35.6% has crossed laterality. These results are presented very next to found for Batistella (2001) and the Rosa Neto (1996).

In human, the preference for the right laterality is superior to the mixing and this superior to the left manual laterality (FONSECA, 1995).

CONCLUSION

We conclude that obese school children have a low level of motor development. Obese children no have a good motor stimulation for its development because the exclusion in daily physical activities, mainly to those makes in the school.

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OBESITY AND MOTOR DEVELOPMENT - A CROSS-SECTIONAL STUDY WITH BRAZILIANS SCHOOL CHILDREN

Abstract

The obesity in childhood is associated with several problems related to the health in the adult life. Evidences exist that psychomotor development of obese children is wronged in detriment of the body scheme disorders. The objective of this study is evaluate the motor development of obese children. A total of 194 obese primary-school children aged 6-10 years, of both sexes, were selected. The data had been collected in three schools of São Jose (Santa Catarina). The 90th percentile for BMI/Age was used to classify the children with obesity, and the Scale of Motor Development (Rosa Neto, 2001) was used to evaluate the motor development. In the statistical treatment it was used descriptive statistics and the software Epi info. Results: the obese school children of this study showed inferior motor development for its chronological age. The areas that had presented greater deficit had been temporal organization, space organization and balance. We believe that obese children do not have an conformed motor stimulation for its development, and that this can be related to the lifestyle of the same ones.

OBÉSITÉ ET DÉVELOPPMENT MOTEUR - UNE ÉTUDE TRANSVERSALE AVEC DES ÉCOLIERS BRÉSILIENS

Résumé

L'obésité dans l'enfance est associée à plusieurs problèmes liés à la santé dans la vie d'adulte. Les évidences existent que le développement psychomoteur des enfants obèses est fait du tort dans le détriment des désordres d'arrangement de corps. L'objectif de cette étude est évaluent le développment moteur des enfants obèses. Un total de 194 enfants obèses de primaire-école âgés 6-10 ans, des deux sexes, ont été choisis. Les données avaient été rassemblées en trois écoles de São Jose - Santa Catarina. Le quatre-vingt-dixième percentile pour BMI/Age a été employé pour classifier les enfants avec l'obésité, et la scale du développment moteur (Rosa Neto, 2001) a été employée pour évaluer le développement moteur. Dans le traitement statistique c'était des statistiques descriptives utilisées et l'information d'Epi de logiciel. Résultats : les écoliers obèses de cette étude ont montré le développement moteur inférieur pour son âge chronologique. Les secteurs qui avaient présenté un plus grand déficit avaient été organisation temporelle, organisation de l'espace et équilibre. Nous croyons que les enfants obèses n'ont pas une moteur stimulation conformée pour son développement, et que ceci peut être lié au style de vie de les même.

OBESIDAD Y DESARROLLO MOTOR - UN ESTUDIO TRANSVERSAL CON LOS NIÑOS ESTUDIANTES BRASILEÑOS

Resumen

La obesidad en infancia se asocia a varios problemas relacionados con la salud en la vida del adulto. Las evidencias existen que el desarrollo psicomotor de niños obesos está agraviado en el detrimento de los desórdenes del esquema corporal. El objetivo de este estudio es evalúa el desarrollo motor de niños obesos. Fueram seleccionados un total de 194 niños obesos de la primario-escuela, 6-10 años, de ambos sexos. Los datos habían sido recogidos en tres escuelas de São Jose - Santa Catarina. El 90 porcentaje para BMI/Age fue utilizado para clasificar a los niños con obesidad, y la Escala del Desarrollo Motor (Rosa Neto, 2001) fue utilizada para evaluar el desarrollo motor. En el tratamiento estadístico era estadística descriptiva usada y el software Epi Info. Resultados: los niños obesos de este estudio demostraron el desarrollo motor inferior para su edad cronológica. Las áreas que habían presentado mayor déficit habían sido organización temporal, organización del espacio y equilibrio. Creemos que los niños obesos no tienen un estímulo motor adequado para su desarrollo, y que esto se puede relacionar con la forma de vida de los mismos.

OBESIDADE E DESENVOLVIMENTO MOTOR - UM ESTUDO TRANVERSAL COM ESCOLARES CATARINENSES

Resumo

A obesidade na infância é preditora de uma série de problemas relacionados à saúde na vida adulta. Existem evidências de que o desenvolvimento psicomotor de crianças obesas é prejudicado por transtornos do esquema corporal. Este estudo teve como objetivo avaliar o desenvolvimento motor de crianças obesas, de ambos os sexos, na faixa etária de 6 a 10 anos. Os dados foram coletados em três escolas, de onde foram selecionados e aplicados os testes em 194 escolares obesos, de 1ª à 4ª série do ensino fundamental, da rede municipal de ensino da cidade de São José (SC). Para classificar as crianças com obesidade, utilizou-se o percentil 90 da relação IMC/idade, e para avaliar o desenvolvimento motor a Escala de Desenvolvimento Motor (EDM) (ROSA NETO, 2001). No tratamento estatístico utilizou-se a estatística descritiva e o Epi info. Os resultados demonstraram que as crianças obesas apresentam seu desenvolvimento motor inferior a sua idade cronológica. As áreas que apresentaram maior déficit foram organização temporal, organização espacial e equilíbrio. De acordo com a EDM, as crianças obesas não apresentaram uma estimulação motora adequada para o seu desenvolvimento. Estudos sobre o estilo de vida das mesmas poderão elucidar possíveis relações com o desenvolvimento psicomotor.