140 - ANTHROPOMETRIC PROFILE, FAST GLYCEMIA, ARTERIAL PRESSURE AND METABOLIC SYNDROME IN CHILDREN FROM 3 TO 7 YEARS

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Introduction

The obesity is one of the most prevalent factor risks of chronic diseases in the world (BOUCHARD, 2003). The same author says that among the main risk factors for diseases, is the hypertension.

The Pan-American Health Organization, with the Worldwide Health Organization (2003), said that in the world, there are more than 1 billion of adults with overweight. From these, at least 300 million are obese. The social changings and the nutritional transiction give impulse to the obesity epidemic.

Bouchard (2003) remarks that there was a drastic increase on the prevalence of obesity in this century, what indicates that this situation might get more serious on the next decades.

Regarding the childish obesity, the Pan-American Organization/Worldwide Health Organization declared that the same already presents epidemic proportions in some areas and in other ones, it has grown up. It is a global problem that reaches the countries that are developing in a crescent way.

On the last decade, the prevalence of obesity increased 32 %. On the developed countries, where the food that are rich in energy are cheap and many, the life styles are more and more sedentary. The obesity is already a significant problem. The obesity has been growing up and it is considered as a big public health problem. In Brazil, 20 % of children are over weighted (MONTEIRO et al. 2000).

The Pan-American Organization/Worldwide Health Organization alarmed that among the risks to the health, those more important are hypertension, high tenor of cholesterol, obesity. And they confirm that 600 million of people are hyper tenses on the world, and it may cause the death of 7, 1 million of them, so that the death rate is 13 % because of hypertension.

Researches from Cook et al. (2003), Chen et al. (1999) and Chen et al. (2000) established the prevalence of the metabolic syndrome during the childhood. The global prevalence of metabolic syndrome in teenagers on the USA was 4, 2. The rates of prevalence were higher among men (6, 1 %) than in women (2, 1 %). The prevalence of one and two components of metabolic syndrome was 41 % and 14, 2 %, respectively. Weiss et al. (2006), to verify the effect of different grades of obesity in children for the prevalence of the metabolic syndrome and their relation of resistance to insulin, concluded that the prevalence is higher among obese children and teenagers.

General objective

The objective of the research was to identify the anthropometric profile, fast glycemia, arterial pressure and components' risks of metabolic syndrome in children from 3 to 7 years old.

Material and Method

Population and sample

The research was realized in Anápolis- GO, in the months of August and September of 2006. It evolved 116 children of childish education, on the ages of 3 to 7 years, from both genders. The descriptive research was used, to describe the characteristics of the population.

116 pre-scholars were valuated, 68 were boys (58, 63 %) and 48 were girls (41, 73 %). The children were valuated on their anthropometric measures (weight, height, and waist-hip perimeter), glycemia test and arterial pressure.

Instruments

The weight was checked with the platform balance of the brand Welmys, with a maximum charge of 150 kg and a precision of 100 g, with the children wearing only underwears and without shoes, in an erect position, united heels, with their toes away from the other feet ones and they couldn't move. For the stature data collection, an anthropometric tape was glued on the wall, brand Sanny®, with precision of 1 mm, and the children were checked in a erect position, without shoes, and they had on their backs a plan surface, arms by the side of the body, united heels and the toes away, knees on contact, head adjusted to the Frankfurt plan and inspirating deeply. The waist-hip perimeter was measured with the same tape Sanny®, and the child had expiration on the smaller circumference area of the waist and hip, where the bigger trochanters were found.

The arterial pressure was measured by the HD manguito, in partnership to the Health Secretary of this city, and it had the support of two nurses, who had technical formation for measuring the same on the children, who were sitting with the left arm in a table. The glycemia test was done on the Chemistry Analysis laboratory. The exam was realized with the kids in 12 hours fast. The normality values for this exam were considered between 80 to 120 mg/dL (AMERICAN DIABETES ASSOCIATION, 2004).

For the statistical analysis, the test "t" student was the Pearson correlation was used. The calculation was realized with the help of the SPSS software (Statistical Package for Social Sciences).

Procedures

On the first moment, there was a contact with the responsible for the entity; the study was approved by the children's parents after the realization of a meeting with these ones, with the receivement of an explanation paper. All the children that parents wanted to participate of the project were included on the research. The entity was chosen by the better acceptance that each one had to the research and the support that each one could give to the development of this studies.

Results

The overweight and obesity, together, reached 10, 3 % of the boys and 5, 17 % of the girls. On the chart, we can find the results in children in agreement to the IMC. It is seen that children of 5 years old showed a significant number of obese boys. As can be watched, there is a difference between obese and over weighted children that is relational to sex. Generally, the IMC

average was of 15, 89 % kg/m.

	SOBREPESO		OBESIDADE	
Idade	Masculino (N%)	Feminino(N%)	Masculino(N%)	Feminino(N%)
3	---	---	----	1(0,8%)
4	3 (2,5%0	1 (0,8%)	---	---
5	5 (4,3%)*	2 (1,7%)*	---	1 (0,8%)
6	2 (1,7%)	1 (0,8%)	---	1 (0,8%)
7	----	----	----	----

Chart 1 - Characterization of overweight and obesity in agreement to the IMC.
p=0.05

On the fast glycemia test, 12 boys (17, 64 %) and 10 girls (20, 83 %) presented fast glycemia above 120 mg/dL. The general average was of 95 mg/dL, what is considered normal for this age.

The average values for arterial pressure (AP) presented a normal classification even that two children showed an AP of 135/85.

Regarding the discoveries on the waist-hip relations, it was verified, that on the medium of the obese children there wasn't any significant difference when compared to euthrophic kids. On the comparison of the children's waist with the overweight and obesity, in euthropic kids we can notice a considerable increase, where can be found a co-relation between the waist perimeter with overweight and obesity. The same tendency was observed on the hip perimeter.

The prevalence of one and two components of the metabolic syndrome was of 18, 96 % and 8, 62 %, respectively. Two children presented 3 components of metabolic syndrome, being the disease found here.

Discussion

The frequency of the overweight valuated in preschoolers is high, and similar to what was observed in a research done by Corso et al. (2003) in Florianópolis,SC . Oliveira et al. (2003), in a research about overweight and obesity prevalence, in the city of Feira de Santana- Ba, concluded that this prevalence showed to be higher and similar to another researches in Brazil.

Giugliano and Melo (2004), in their investigation to make a diagnosis of obesity and overweight in scholars found out 21, 2 % on girls and 18, 8 % on boys.

As Mancini (2002) said, the numbers of obese children are impaired to the numbers of obesity in the world and in Brazil. The obesity and overweight gained rates on children as the years were passing by: in the year of 1996, it had a rate of 3, 0 % in boys from 2 to 3 years old and 3, 2 % in boys from 3 to 5 years old. In girls, it was 1, 9 % for girls from 2 to 3 years old and 7, 6 % for girls from 4 to 5 years old.

On this research, the overweight and obesity reached 10, 3 % of boys and 5, 17 % of girls.

In a research realized by Abrantes, et al. (2002), about the prevalence of overweight and obesity upon children and teenagers from the Southeast and Northeast regions, it was concluded that 8, 2 % and 11, 9 % were the rates on these regions, respectively. The authors, later, grouped these regions and found out that childish obesity had rates of 10, 3 % for girls and 9, 2 % for boys.

The use of IMC by age, in agreement to the limitations proposed by Cole (2000), showed a good agreement with the growing adiposity on the groups. This result reinforces the observations of other authors about the good co- relation between adiposity and the IMC in children.

Giugliano and Melo (2004), used the IMC as the international pattern and remarked it was appropriate for the diagnoses of overweight and obesity on the age rate studied.

Oliveira et al. (2004) used the same rate in a research in Feira de Santana-BA to comprove of overweight and obesity, as the affirmation from Halpern e Mancini (2002) that says that the second critic period for children to get obese is from 5 to 7 years of age.

Abrantes et al. (2002) on his actual research found out that the prevalence of obesity in childhood was always bigger than its prevalence in adolescence. This difference was explained by the use of different anthropometric rates: weight/height in childhood and IMC in adolescence.

Giugliano and Melo (2004) concluded that the medium values for waist perimeter on the studied children, as the age IMC, are significantly more elevated on overweight and obese children.

The same authors consider that the prevalence of metabolic syndrome for the hip perimeter, compared to the waist-hip relation, didn't show differences for euthrophic children and overweight and obese children, in both genders.

Weiss et al. (2006) concluded that the prevalence of metabolic syndrome was higher among obese children and teenagers. The results of this research reinforce that Weiss' study, because all these obese children showed at least 2 components of metabolic syndrome.

As Goldfarb (2005), almost a million of teenagers in USA, or 4 % approximately, have signs and symptoms of metabolic syndrome. In postpubertal teenagers, this prevalence almost reaches the 30 %.

Conclusion

The results of this study show that overweight and obesity, together, reached 10, 3 % of boys and 5, 17 % of the girls. The rate was bigger for boys. The 5 years old children showed a significant number of obese boys.

On the glycemia test we didn't find, on the 12 hour fast glycemia, any abnormality.

On the arterial pressure measure, there weren't any children with abnormal levels of arterial pressure.

On the comparison of the waist perimeter of obese and overweighed children with euthrophic children, there is a considerable increase of the measures on obese children. The same tendency was observed with the hip perimeter. On the waist-hip relation, there wasn't any significant difference among euthrophic and obese children.

The prevalence of one and two components of the metabolic syndrome was of 18, 96 % and 8, 62 %, respectively. Two children showed 3 components of metabolic syndrome, so we can found the disease.

Generally, children showed a high risk for metabolic syndrome.

Bibliographical References

ABRANTES, Marcelo M. et. al. Prevalência de sobrepeso e obesidade em crianças e adolescentes das regiões Sudeste e Nordeste. **Jornal de Pediatria.** Rio de Janeiro, v. 78, n. 4, p.335-340, 2002. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S002175572002000400014&lng=pt&nrm=iso Acesso em: 19 ago. 2004.

AMERICAN DIABETES ASSOCIATION. Standards of care, 17 January, **2004.** Disponível em:<**http://www.diabetes.org/type1/medical/standards/standards.jsp**>.Aceso em: 20 jan.2006.
BJÖRNTORP, P. Body fat distribution , insulin resistence, and metabolic diseases. **Nutrition**, v. 3, p.795-803.1997.
BOUCHARD, Claude. **Atividade Física e Obesidade**. São Paulo: Manole, 2003.
CHEN, W. Age-related patterns of the clustering of cardiovascular risk variables of syndrome X from childhood to young adulthood in a population made up of black and white subjects: the Bogalusa Heart Study. **Diabetes**, v.49, p.1042-1048, 2000.
CHEN, W. Cardiovascular risk factors clustering features of insulin resistance syndrome (Syndrome X) in a biracial (Black-White) population of children, adolescents, and young adults: the Bogalusa Heart Study. *Am J* **Epidemio***l*, v.150, p.667-674, 1999.
COLE, T. J. Establishing a standard definition for child overweight and obesity worldwide: international survey. **British Medical Journal**, V.320, May, 2000. Disponível em: http://www.abeso.org.br/artigo1.htm Acesso em: 20 ago. 2004.
COOK, S. *et al.*: Prevalence of a metabolic syndrome phenotype in adolescents: findings from the third National Health and Nutrition Examination Survey, 1988-1994. **Arch Pediatr Adolesc Med**, v. 157 ,p.821-827, 2003.
CORSO, Arlete C. T. et al. Sobrepeso em crianças menores de 6 anos de idade em Florianópolis, SC. **Revista Nutri Campinas.** Campinas, v. 16. n .1, p. 21-28, jan/mar 2003. Disponível em: http://www.scielo.br/scielo.php?pid=S1415-52732003000100003&script=sci_arttext&tlng=pt Acesso em: 10 set. 2004.
GIUGLIANO, Rodolfo; MELO, Ana L. P. Diagnóstico de sobrepeso e obesidade em escolares: utilização do índice de massa corporal segundo padrão internacional. **Jornal de Pediatria.** Rio de Janeiro, v. 80, n. 2, p.335-340, 2004. Disponível em: http://www.scielo.br/scielo.php?pid=S141552732003000100003&script=sci_arttext&tlng=pt Acesso em: 10 ago. 2006.
HALPERN, Zuleika Salles Cozzi; MANCINI, Maria Magaly A.Medeiros. Avaliação e Tratamento da Obesidade na Infância. In: HALPERN, Alfredo; MANCINI, Marcio Corrêa. **Manual de Obesidade para o Clínico**. São Paulo: Roca, 2002.
LERARIO, Daniel D. G. et al . Excesso de peso e gordura abdominal para a síndrome metabólica em nipo-brasileiros. **Rev. Saúde Pública**., São Paulo, v. 36, n. 1, 2002. Disponível em: <http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-89102002000100002&lng=pt&nrm=iso>. Acesso em: 01 nov. 2006.
MANCINI, Márcio. Métodos de avaliação de obesidade e alguns dados epidemiológicos . **Revista Abeso.** V. 3, n. 11, dez, 2002. Disponível em: http://www.abeso.org.br/revista/revista11/index.htm Acesso em: 12 ago. 2004.
OLIVEIRA, Ana Mayra A. et al. Sobrepeso e Obesidade Infantil: Influência de Fatores Biológicos e Ambientais em Feira de Santana, BA. **Arq Bras Endocrinol Metab.**V.47, n.2, abr. 2003. Disponível em: http://www.abeso.org.Br/pdf/obes_em_feira_de_Santana.pdf Acesso em: 03 set. 2004.
WEISS, R. Obesity and the Metabolic Syndrome in Children and Adolescents. **N Engl J Med** , v.350, p.2362-2374., 2004.
WORLD HEALTH ORGANIZATION. Obesity: preventing and managing the global epidemic. Report of WHO Consultation on Obesity. Geneva; 2003.

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ANTHROPOMETRIC PROFILE, FAST GLYCEMIA, ARTERIAL PRESSURE AND METABOLIC SYNDROME IN CHILDREN FROM 3 TO 7 YEARS

Overweight and childish obesity show an elevated prevalence and multi-factorial character. The alterations on arterial pressure, on the glycemic rate, on the IMC and on the waist and hip perimeter suggest that obesity contributes for the metabolic syndrome. The objective of this research was to identify the anthropometric profile, fast glycemia, arterial pressure and risk of metabolic syndrome in children from 3 to 7 years old. 116 pre-scholars were valuated, from both genders, the used tests were: weight, height, waist-hip, glycemia and arterial pressure. The children were classified as euthrophic, over weighted and obese in agreement to the IMC. The measure of the first waist-hip perimeter had a significant comparison. In the glycemia test, 12 boys (17, 64 %) and 10 girls (20, 83 %) presented fast glycemia over 120 mg/dL. The medium average was of 95 mg/dL, considered normal for the age. The arterial pressure showed, inside the parameters of normality. The prevalence of overweight and obesity together, reached 10, 3 % of the boys and 5, 17 % of the girls. The averages of the measures of the waists and hips of boys and girls (52, 2 cm and51, 2) were significant different from those who are obese (63, 0 and 58, 2 cm). There wasn't any difference on the waists-hips measures between the groups. The prevalence of one and two components of the metabolic syndrome was of 18, 96 and 8, 62 %, respectively. Two children presented 3 components of metabolic syndrome, being the disease found. Concluding, the level of adiposity was bigger for the masculine sex, on the fast glycemia test 12 boys (17, 64 %) and 10 girls (20, 83 %) presented fast glycemia above 120 mg/dL, 2 children presented PA of 135/85. Generally, children showed a high risk for metabolic syndrome.

Key-words: anthropometry, children, metabolic syndrome.

PROFIL ANTROPOMETRIQUE, GLYCEMIE À JEUN , PRESSION ARTERIELLE ET RISQUE DE SYNDROME METABOLIQUE CHEZ LES ENFANTS DE 3 À 7 ANS

L`objectif de cet étude a été d´identifier le profil antropometrique, glycemie à jeun, pression artérielle et risque de syndrome metabolique chez les enfants entre 3 et 7 ans. On a évalué 116 pre-scolaires, de deux sexes. Les mesures utilisées ont été : poids, hauteur, ceinture- hanches, glycemie et pression artérielle. Les enfants ont été classifiés comme eutrophyques, surpoids et obessité selon le IMC, le calcul du perimètre ceinture-hanches a eu une comparaison significative. Dans l´analyse de la gycemie, 12 enfants du sexe masculin (17,64%) et 10 du sexe feminin (20, 83%) ont présenté glycemie à jeun superieure à 120 mg/dL, en moyenne de 95 mg/ dL considerée normale en rapport à l´âge. La pression artérielle a été dans les paramètres normaux. La prévalence du surpoids et obessité a été de 10,3% chez les enfants et 5, 17% chez les filles. Les mesures, en moyenne de la circonference ceinture-hanches chez les garçons et les filles eutrophyques, ont été de 52,2 cm. et de 51,2 cm. respectivement, ils ont été significativement différents du groupe avec obessité (63,0 cm. et 58,5 cm.) . Il n´y a pas eu aucune

différence par rapport à la ceinture-hanches, entre les groupes étudiés. La prévalence de un ou deux composants du syndrôme metabolique a été de 18.96% et de 8,62% respectivement. Deux enfants ont présenté 3 composants su syndrôme métabolique, caracterisant le diagnostique. On infère que le niveau de graisse corporelle a été plus grand chez le sexe masculin, dans l´analyse de glycemie à jeun, 12 enfants (12,61%) et 10 filles (20,83%) ont présenté une glycemie à jeun superieure à 120 mg/dL. 2 enfants ont présenté PA de 135/85. De manière globale, les enfants ont présenté un grand risque pour le syndrôme metabolique.

Mots clé : antropometrique, glycemie à jeun, pression artérielle, syndrôme metabolique.

PERFIL ANTROPOMETRICO, GLICEMIA EN AYUNAS, PRESION ARTERIAL Y RIESGO DE SINDROME METABOLICO EN NIÑOS ENTRE 3 Y 7 AÑOS.

El objetivo de este estudio fué identificar el perfil antropométrico, la glicemia en ayunas, la presión arterial y el riesgo de síndrome metabólico en niños entre 3 y 7 años. Fueron evaluados 116 preescolares de ambos sexos, las mediciones usadas fueron: peso, altura, cintura-cadera, glicemia y presión arterial. Los niños fueron clasificados como eutróficos, sobrepeso y obesidad de acuerdo al IMC, el cálculo del perímetro cintura-cadera tuvo comparación significativa. En el análisis de la glicemia, 12 niños (17,64%) y 10 niñas (20,83%) presentaron glicemia en ayunas superior a 120 mg/dl con un promédio de 95 mg/dl, considerado normal para la edad. La presion arterial estuvo dentro de los parámetros normales. La prevalencia de sobrepeso y obesidad fué de 10,3% en los niños y 5,17% en las niñas. Los promedios de la circunferencia cintura-cadera en los niños y niñas eutróficos fueron de 52,2cm y 51,2cm respectivamente, siendo significativamente diferentes del grupo con obesidad (63,0cm y 58,5cm). No hubo diferencia de la relación cintura-cadera entre los grupos estudiados. La prevalencia de uno o dos de los componentes del síndrome metabólico fué de 18,96% y 8,62% respectivamente. Dos niños presentaron 3 componentes del síndrome metabólico, caracterizando el diagnóstico del mismo. Se concluye que el nivel de grasa corporal fué mayor en el sexo masculino, en el análisis de la glicemia en ayunas, 12 niños (17,64%) y 10 niñas (20,83%) presentaron una glicemia en ayunas superior a 120 mg/dl, 2 niños presentaron PA de 135/85. De forma global, los niños presentaron un alto riesgo para el síndrome metabólico.

Palabras llave: antropométrico, glicemia en ayunas, presión arterial, síndrome metabólica.

PERFIL ANTROPOMÉTRICO, GLICEMIA DE JEJUM, PRESSÃO ARTERIAL E RISCO DE SÍNDROME METABÓLICA EM CRIANÇAS DE 3 A 7 ANOS

Sobrepeso e obesidade infantil apresentam prevalência elevada e caráter multifatorial. As alterações na pressão arterial, no índice glicêmico, no IMC e no perímetro da cintura e do quadril sugerem a obesidade como uma das inúmeras causas, sendo considerados fatores que contribuem para a síndrome metabólica. O objetivo do trabalho foi identificar o perfil antropométrico, glicemia de jejum, pressão arterial e risco de síndrome metabólica em crianças de 3 a 7 anos.. Foram avaliados 116 pré-escolares de ambos os sexos, os testes utilizados foram: peso, altura, cintura-quadril, glicemia e pressão arterial. As crianças formam classificadas como eutróficas, sobrepeso e obesidade de acordo com o IMC, a mensuração do perímetro da cintura-quadril teve comparação significativa. No teste de glicemia 12 crianças do sexo masculino (17,64%) e 10 do sexo feminino (20,83%) apresentaram glicemia de jejum acima de 120 mg/dL . A média geral foi de 95 mg/dL, considerada normal para a idade. A pressão arterial apresentou dentro dos parâmetros de normalidade. A prevalência de sobrepeso e obesidade em conjunto, atingiu 10,3% dos meninos e 5,17% das meninas. As médias das circunferências cintura e quadril dos meninos e meninas eutróficos (52,2 cm e 51,2) diferiram significativamente daqueles com obesidade (63,0 cm e 58,5 cm). Não houve diferença na razão cintura-quadril entre os grupos. A prevalência de um e dois componentes da síndrome metabólica foi de 18,96% e 8,62%, respectivamente. Duas crianças apresentaram 3 componentes da síndrome metabólica, sendo dessa forma caracterizado a doença. Conclui-se que o nível de adiposidade foi maior no sexo masculino, no teste de glicemia em jejum 12 crianças do sexo masculino (17,64%) e 10 do sexo feminino (20,83%) apresentaram glicemia de jejum acima de 120 mg/dL ,2 crianças apresentaram PA de 135/85. No geral as crianças apresentaram risco alto para a síndrome metabólica.

Palavras - Chave**:** Antropometria, Crianças; Síndrome Metabólica.