78 - PREVALENCE OF DYSLIPIDEMIA IN EUTROPHIC ADOLESCENTS

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INTRODUCTION

The economic burden from cardiovascular diseases has increase exponentially in the last decades. In 2000, the cardiovascular diseases were responsible for the main public resources allocation in Brazil, R$ 821 million, and were 3ª cause of hospital permanence (SBC, 2001).

The coronariopathy is, in general, dependent of the risk factors prevalence, thus how greater is the presence of risk factors for atherosclerosis, greater the probability of its incidence (SBC, 2005). Among the cardiovascular risk factors the more frequent: are hypercholesterolemia, tabagism, hypertension, hipertriglyceridemia, obesity and familiar history of ischemic cardiopathy, which affect also young individuals (GERBER & ZIELINSKY, 1997).

Analyzing the lipid profile in pediatrics populations, Moura et al. (2000), evaluating 1600 schoolchildren aged 7 to 14 years old, verified prevalence of hypercholesterolemia in 35%. In the same way, Giuliano et al. (2005), evaluating 1053 schoolchildren aged 7 to 18 years old, found a prevalence of: hypercholesterolemia 10%; hipertriglyceridemia 22%; elevated LDL-C 6% and low HDL-C 5%.

However, some evidences demonstrated that the obesity is the most important contributor for appearance of the cardiovascular diseases risk factors in pediatric population (BOREHAM et al., 2001; TWISK et al., 1999). Therefore, the researchers indicated that the prevalence of dyslipidemia can be associated to the weight excess, once were evaluated children and adolescents with different nutritional status (normal, overweight, obesity).

Following the same direction, the objective of this study is to verify the prevalence of dyslipidemia in eutrophic adolescents of São Mateus do Sul city, Paraná, Brazil.

METHODOLOGY

Subjects: 112 eutrophic adolescents (49 of males and 63 females) were evaluated, with ages between 13 to 16 years old, being classified in puberty stage 3 and 4 of Tanner (1962). All children were matriculated in the education public system of the city of São Mateus do Sul, Paraná, Brazil.

Before testing began, all individuals and their corresponding guardians were informed of all procedures involved and filled out an authorization and a release form consenting to the used of their data. This research was approved by the Federal University of the Paraná the Ethics Committee, resolution 196/96.

Instruments and procedures

Anthropometry: To measure height, the "WCS" stadiometer with scale of 0,1 cm was used. The weight was evaluated using a "PLENNA" digital balance, with resolution of 100g (DOCHERTY, 1996). The body mass index (BMI) was calculated by the mathematical formula: BMI= weight/starture$_2$.

For classification of the subjects by nutritional status (eutrophic), the point of cut for BMI values below percentile 85th was used. For this classification, the Brazilian population tables from 0 the 25 years old, by sex and age were used (Anjos et. Al, 1998).

Lipid profile: Approximately 8 ml of blood was taken from each individual for laboratorial analysis: total cholesterol (CT), LDL cholesterol (LDL-C), HDL cholesterol (HDL-C) and triglycerides (TG).

The recommendation followed the Brazilian Society of Cardiology (2001): a) 12 hours overnight fast; b) to evict the alcohol consumption 3 days before the test; c) to evict the alimentary abuse (in special fat) in the previous day to the test.

The data samples were processed and analyzed in the same day of the collection, being used serum for all analysis. CT mg/dL, HDL-C mg/dL and TG mg/dL were determined by automated enzymatic techniques (ABBOTT SPECTRUM model CCX). The LDL-C mg/dL concentrations was calculated according to the formula of Friedewald et al. (1972): (LDL-C = TG - HDL-TG/5).

Statistics

Initially, it was used descriptive statistics (mean and standard deviation) for sample characterization. For the lipid profile classification the distribution of frequencies was used. The procedure followed the reference values for pediatric population (table 1) suggested by the Brazilian Society of Cardiology (2005).

Table 1. Lipids reference values suggested aged 2 to 19 anos

Good (mg/dL)	Limits (mg/dL)	Elevated (mg/dL)
<150	150-169	=170
<100	100-129	=130
= 45	---	---
<100	100-129	=130

Source: Brazilian Society of Cardiology (2005).

RESULTS AND DISCUSSION

In table 2 are show the characterization of the sample for the anthropometrics variables and blood lipid profile. Table 3 demonstrates the prevalence of dyslipidemia in adolescents of both genders.

Table 2. Characterization of the sample

Variables	Male	Female
Age (years)	**14,48 ± 1,26**	**14,30 ± 1,00**
BMI (kg/m²)	**19,69 ± 2,73**	**21,95 ± 17,22**
CT (mg/dL)	**142,51 ± 30,25**	**143,65 ± 26,51**
HDL-C (mg/dL)	**44,24 ± 8,84**	**45,76 ± 14,57**
DL-C (mg/dL)	**81,65 ± 27,26**	**78,28 ± 26,06**
G (mg/dL)	**82,69 ± 35,09**	**82,96 ± 41,65**

Table 3. Prevalence of dyslipidemia in adolescents of both genders

Good		Limits		Elevated	
Male	Female	Male	Female	Male	Female
67,3%	61,9%	12,3%	25,4%	20,4%	12,7%
73,5%	77,8%	20,4%	22,2%	6,1%	---
40,8%	50,8%	59,2%†	49,2%†	---	---
83,7%	71,4%	8,1%	14,3%	8,2%	14,3%

† Subjects with HDL-C < 45 mg/dL

It is observed in the CT values that the biggest proportion of adolescents of both gender meet "good" levels. This possibly might be by the fact that these children have in their lifestyle a balanced diet that contributes for the maintenance of good blood cholesterol concentrations (SANTOS et al., 2006).

The proportion of adolescents with inadequate levels dyslipidemia (elevated) we greater in the boys, with increased values of CT. However, for the girls, the incidence in the inadequate levels presented a bigger proportion in the limits level. These results correspond to the necessity to implement a adequate nutritional orientation for the adolescents, recommending lesser food ingestion that contains saturated fats in the attempt to revert the blood CT concentrations (GUEDES and GUEDES, 2003).

Consistent with the findings of this study, the prevalence of hypercholesterolemia in adolescents of both genders also can be observed in the city of Florianópolis - SC, where Giuliano et al. (2005) found that 28% of the individuals with limits values of CT and 10% with elevated values. The divergence between the studies in part can be explained by the fact that the Florianópolis research classified the individuals of both genders together, while this research verified the prevalence of hypercholesterolemia in each gender separately, because during the adolescence, girls always present higher CT values than boys (BROTONS et al., 1998).

Analyzing the LDL-C incidence, it is observed, that for both genders, the biggest proportion of the sample presented within good values. However, 6.1% of the boys presented elevated values. These characteristics, without measures of intervention, can cause in a long term period the risk factors to appear more serious (BOREHAM et al., 2002). It may happen because the LDL-C contains in its structure a higher amount of fats and less ratio of proteins, what makes it difficult to be removed from the plasma, consequently, what may cause the appearance of plates in the artery, which can lead to the sprouting of cardiovascular disease as hypertension, glucose intolerance and deficiency in the insulin receivers (GERBER and ZIELINSKY, 1997).

In the same direction, the limits values of the LDL-C can be influenced by the high incidence of adolescents with HDL-C values below of the recommended. This occurs by the fact that the HDL-C has the function to remove to the liver the excess cholesterol deposited in the sanguineous circulation, therefore it consists of lipoprotein formed by the union of phospholipids, triglycerides and apoproteíns apo-A (GUYTON and HALL, 2002).

In the study of Giuliano et al. (2005) a lesser proportion of adolescents was observed (14%) in the elevated values of LDL-C, compared with the present study (6%).

For the TG incidence, it is observed that the majority of adolescents, of both genders, presented good levels, with a small proportion within the limits and elevated values.

For this variable, the sample of this study presented less incidence of adolescents within the limits and elevated values compared with the sample of the Giuliano et al. (2005), they presented 22% of the subjects with elevated TG values, indicating blood hipertriglyceridemia.

For Guyton and Hall (2002), triglycerides are the main molecule of storage of fat in the blood (99%) and tissues (95%). Therefore, to keep its concentrations in the desirable levels becomes evident. The hipertriglyceridemia rare appears isolated, it is followed by other risk factors such as hypercholesterolemia (SCHIAVO et al., 2003). Therefore, this situation can be considered as the primary disturbances capable of increase the risk of atherosclerosis, and beyond that the excess of intramuscular triglycerides will influences the increase of fat tissue (SANTOS et al., 2006).

In this direction, Lima and Glaner (2006) indicated that the hipertriglyceridemia is the coronary risk factor of more easy control, therefore the levels of triglycerides can satisfactorily be controlled through changes in the behavior habits as the adoption of balanced diet, increase of the physical activity levels and alcohol restriction.

In synthesis, it is very important the early intervention in the prevention of the risk factors in the pediatric population, because children and adolescents tend to remain in the same percentiles of cholesterol and blood lipids until the adult life. This phenomenon is called *"tracking"*, or stability, characterized that the undesirable levels of lipids isolated or clustering in the growth and development years, will increase the risk of coronary diseases (BOREHAM et al., 2002).

CONCLUSION

Based in these results, it was observed that the majority of the adolescents presented good values for the blood lipids concentrations. However, although the individuals demonstrated BMI values recommended for age, in both the genders adolescents were found with increased values of lipids, in special for the HDL-C. Therefore, become evident that the health professionals must recommend to the parents the adoption of a healthful lifestyle, adopting a balanced diet and regular physical activity.

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PREVALENCE OF DYSLIPIDEMIA EUTROPHIC ADOLESCENTS

ABSTRACT

Objective: To verify the dyslipidemias prevalence in eutrophic adolescents. **Methodology:** The sample was constituted of 49 males 63 females, with ages between 13 and 16 years, classified in the 3 and 4 sexual maturation stages (TANNER, 1962). From the relationship corporal mass / height^2 was calculated the IMC to classify the nutritional status, establishing as eutrophia cut point the percentil 85th. For the determination of the blood concentrations of the total cholesterol, HDL-C and triglycerides (TG) the enzymatic-colorimeter method was used. LDL-C was calculated by the Friedewald et al. (1972) formula: LDL-C = CT - HDL-TG/5. The descriptive statistics was used (mean and standard deviation), soon after distribution of frequencies was accomplished for classification of the lipidic profile. **Results:** Hipercholesterolemia were detected in 12,3% of the boys and 25,4% of the girls presenting limits values, and 20,4% of the boys and 12,7 of the girls with elevated values. The LDL-C increased was found in 20,4% of the boys and 22,2% of the girls presenting limits values, and 6,1% of the boys with elevated values. They presented bordering values of the boys' HDL-C 59,2% and 49,2% of the girls. The hipertriglyceridemia was found in 8,1% of the boys and 14,3 of the girls with limits values, and 8,2% of the boys and 14,3% of the girls with elevated values. **Conclusion:** These results take to the need of adopting an efficient strategy of nutritional orientation and incentive to the practice of physical activities, in the intention of to revert or to maintain the blood lipids concentrations in this adolescents.

Key words: dyslipidemia, risk factors, adolescents.

PREVALESCENCE DE DISLIPIDEMIES EN ADOLESCENTS EUTROPHIQUES

RESUMÉ

Objectif : Vérifier la prévalescence de dislipidemies en adolescents eutrophiques. **Méthodologie :** L'échantillon a été constitué par 49 adolescents du sexe masculin et 63 du sexe féminin, avec l'âges entre 13 et 16 ans, classifiés dans les stages 3 et 4 de maturation sexuelle (TANNER, 1962). A partir de la relation masse corporel / stature^2, l'IMC a été retrouvé pour classifier l'état nutritionel, en établissent comme point de coupure pour l'eutrophie le pourcentage de 85. Pour la détermination des concentrations sanguines du cholestérol total, HDL-C et triglicérides (TG) a été utilisé le méthode enzimatique-colorimétrique. Le VLDL a été calculé à partir de la formule : TG/3. Le LDL-C a été calculé à partir de la formule de Friedewald et al. (1972) : LDL-C = CT - HDL-TG/5. Il a été utilisé la statistique descriptive (moyenne et déviation standard), en suite la distribuition de fréquences a été faite pour la classification du profil lipidique. **Résultats :** Cas de hypercholestérolemie em 12,3% des garçons et 25,4% des filles on été detectés en présentant des valeurs limites et 20,4% des garçons et 12,7% des filles avec des valeurs augmentées. L'èlévation du LDL-C a été trouvé en 20,4% des garçons et 22,2% des filles en présentant des valeurs

limites et 6,1% des garçons avec des valeurs augmentées. 59,2% des garçons et 49,2% des filles ont présenté des valeurs limites de HDL-C. L'hypertriglicéridémie a été trouvé en 8,1% des garçons et 14,3% des filles avec des valeurs limites et 8,2% des garçons et 14,3% des filles avec des valeurs augmentées. **Conclusion :** ces résultats portent au besoin de adopter une efficiente stratégie d'alimentation nutritionel et d'incitation à la pratique d'activités physiques, avec l'intention de rétrocéder ou mantenir les concentrations de lipides plasmatiques des adolescents évalués.

Mots-clés: dislipidemies, facteurs de risque, adolescents.

PREDOMINIO DE DISLIPIDEMIAS EN LOS ADOLESCENTES EUTRÓFICOS

RESUMEN

Objetivo: Verificar el predominio de dislipidemias en adolescentes eutróficos. **Métodos:** La muestra fue constituida de 49 adolescentes de lo sexo masculino y 63 de lo sexo femenino, con edades entre 13 y 16 años, clasificados en períodos del entrenamiento 3 y 4 de maduración sexual (TANNER, 1962). La relación de la masa corporal/estatura^2 resolvió el IMC para clasificar el estado nutricional, estableciendo como punto del corte para eutrofia em la porcentaje de 85 . Para la determinación de las concentraciones sanguineous del colesterol total, el HDL-C y los triglicérides (TG) fueron utilizados el método enzimático-colorimétrico. El VLDL era calculado con el fórmula: TG/3. El LDL-C era calculado por el fórmula de Friedewald y otros. (1972): LDL-C = CT - HDL-TG/5. Usada la estadística descriptiva (media y de desvío padrão), de que fue llevado después con la distribución de las frecuencias para la clasificación del perfil del lipídico. **Resultados:** Fueron detectados los casos del hipercolesterolemia en el 12.3% de niños y 25.4% de las niñas que apresentarm los valores que confinaban limitrofes, y 20.4% de niños y 12.7% de las niñas con valores crecientes. La subida del LDL-C fue encontrada en el 20.4% de los niños y 22.2% de las niñas que presentaban valores limitrofes, y 6.1% de los niños con valores crecientes. La cresciente de lo HDL-C 59.2% de los niños y 49.2% de las niñas. El hipertrigliceridemia fue encontrado en el 8.1% de muchachos y 14.3 de las muchachas con valores que confinaban, y 8.2% de muchachos y 14.3% de las muchachas con valores crecientes. **Conclusión**: Estos resultados conducen a la necesidad para adoptar una estrategia eficiente de la orientación del nutricional e incentivo el práctica de actividades físicas, en la intención de invertir o de guardar las concentraciones de los lipídios de los plasmáticos de los adolescentes evaluados.

Palabras claves: dislipidemias, factores del riesgo, adolescentes.

PREVALÊNCIA DE DISLIPIDEMIAS EM ADOLESCENTES EUTRÓFICOS

RESUMO

Objetivo: Verificar a prevalência de dislipidemias em adolescentes eutróficos. **Metodologia:** A amostra foi constituída de 49 adolescentes do sexo masculino e 63 do sexo feminino, com idades entre 13 e 16 anos, classificados nos estágios 3 e 4 de maturação sexual (TANNER, 1962). A partir da relação massa corporal / estatura^2 encontrou-se o IMC a fim de classificar o estado nutricional, estabelecendo como ponto de corte para a eutrofia o percentil 85. Para a determinação das concentrações sanguíneas do colesterol total, HDL-C e triglicérides (TG) foi utilizado o método enzimático-colorimétrico. O VLDL foi calculado através da fórmula: TG/3. O LDL-C foi calculado pela fórmula de Friedewald et al. (1972): LDL-C = CT - HDL-TG/5. Utilizou-se a estatística descritiva (média e desvio padrão), em seguida foi realizada distribuição de freqüências para classificação do perfil lipídico. **Resultados:** Foram detectados casos de hipercolesterolemia em 12,3% dos meninos e 25,4% das meninas apresentando valores limítrofes, e 20,4% dos meninos e 12,7 das meninas com valores aumentados. A elevação do LDL-C foi encontrada em 20,4% dos meninos e 22,2% das meninas apresentando valores limítrofes, e 6,1% dos meninos com valores aumentados. Apresentaram valores limítrofes de HDL-C 59,2% dos meninos e 49,2% das meninas. A hipertrigliceridemia foi encontrada em 8,1% dos meninos e 14,3 das meninas com valores limítrofes, e 8,2% dos meninos e 14,3% das meninas com valores aumentados. **Conclusão:** Estes resultados levam à necessidade de adotar uma eficiente estratégia de orientação nutricional e incentivo à prática de atividades físicas, na intenção de reverter ou manter as concentrações de lipídios plasmáticos dos adolescentes avaliados.

Palavras-chave: dislipidemias, fatores de risco, adolescentes.