69 - THE GYNECOLOGICAL AGE AND ITS RELATION WITH ANTHROPOMETRICS VARIABLES AND BASIC PHYSICAL QUALITIES OF SCHOOLS

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INTRODUCTION

Considered a significant event in the life of the woman, because it represents the beginning of the reproductive life, menarche involves great transformations of somatic, metabolic, neuromotor and psychosocial orders (DUARTE, 1993). In agreement with Vitalle et al. (2003), even it is a delayed event, is the more used pointer of sexual maturation during the puberty, being related to growth, puberal and infant development. It reflects, still, numerous aspects of health of the population, including the socioeconomic and nutritional status, and the ambient conditions (DUARTE, 1993; TANNER, 1990).

In addition, the accompaniment of the somatic development of children and adolescents is important in the evaluation of the health status, being able to contribute in the diagnosis of the nutritional quality, both in relation to the obesidade and caloric and proteic bednutrition (MARINS et. al., 1995).

In relation to basic the physical qualities, in its totality, they are responsible for the motor performance of an individual, and directly are related with the effective participation in programs of physical activity, being able to play important role in the prevention, conservation and improvement of the functional capacity, and consequently, in the health of the young (GUEDES and GUEDES, 1997).

So, the gynecological age that is gotten with the subtraction of the chronological age for the age of the menarche, seems to be an important resource to extend the relative knowledge to the somatic and motor development of pertaining to school in the period postmenarche, contributing with the evaluation of the somatic development and the motor performance of young women in the puberty period, since it is a resource of sexual maturation of easy application in the pertaining to school environment.

The present study aimed, therefore, to evaluate the relation of the gynecological age with anthropometric variables and basic physical qualities of pubescent non-athletes.

METHODOLOGY

Sample

The target population enclosed the 648 pupils registered in the State College called Leopoldo Américo Miguez de Mello, located in Angra dos Reis /RJ city, regularly frequenting educations basic and average in the school year of 2007. 232 girls had participated of the collection of data who took care of the following criteria of inclusion: to have the informed consent signed to the guardian; to have 10 and 16 years of age; to remember to the month and year of the menarche; not to make look like significant locomotive deficiency or to be pregnant; not to participate of training to dispute sports competitions. However, the sample of this study consisted of 164 girls who had informed the occurrence of the menarch.

The collection of data and its objectives had been approved by the Committee of Ethics of Universidade Castello Branco (UCB), under protocol 0035/2007, in agreement with the resolution 196/96, of the National Advice of Health, which approved the lines of direction and regulations of research involving human beings.

Procedures and protocols

Initially, the study guideline of two meetings for the parents of pupils was, being explained at great length all the procedure. Later, all the pupils had been invited to participate and had received the term from assent and one anamnese with questions that approached the date of birth, the occurrence or not of the menarche, in case of affirmative answers the month and the year of the menarch and on the practical constant of training for sports competitions. Later, with intention to have aid at the moment to remember the time of the menarche, the girls whom they had accepted to participate of the study had filled anamnese next to the responsible one.

Finally, after the delivery of anamnese and the term of assent signed to the researcher for the responsible one of the participants, was marked the hourly date and of the evaluations, in which each individual was evaluated by an only experienced e appraiser in two days consecutive.

In the first day, the anthropometric variable had been surveyed following the standards of the International Society of Advancement of Kinanthropometry (ISAK, 2001) in the measures used in somatotype and the described standards for Lohman et al. 1991, for the equation of the percentage of fat. A digital scale of the mark Plenna Brazil was used, with precision of 0,1 kg, to measure the body mass; the stature was verified with one measure of steel of mark WCS with precision of 1mm; the diameters of humerus and femur, as well as the perimeters of contracted arm and leg had been registered with a precision of 1mm, using one paquimeter of mark WCS and a metallic anthropometric tape measure of the Sanny mark, respectively; the skinfolds of tríceps, to subscapular and medial leg had been collected with one adipometer of the Sanny mark with precision of 1 mm. After a light heating, was still accomplished the tests of vertical jump to measure the explosive force of the inferior members in the vertical plan (BURTON, 1996) and of 50 meters to measure the dislocament (MARINS speed AND GIANNICHI, 1996), respectively.

In the second day, after the heating, the test of potency aerobics "maximal multstage 20m shuttle run test" was accomplished (SRT-20) to esteem the maximum consumption of oxygen (relative VO2máx) (LÉGER et al., 1988).

Of ownership of these data, it was possible to calculate the gynecological age, the index body mass (BMI), the percentile of fat (% gordura)(SLAUGHTER et al. 1988) together with the masses fat and thin, besides the components of somatotype anthropometric and Carter and Heath (1990), that evaluate the relative adiposity, the magnitude muscle skeletal and the corporal linearidade, through the endomorphy, mesomorphy and ectomorphy, respectively.

Statistical

The mean and standard deviation were used for the description of the data, while the correlation of Pearson verified the relation of the gynecological age with the variables anthropometrics and basic physical qualities, adopting $p < 0,01$. The

software used for the analysis was SPSS 12.0.

RESULTS

The table 1 presents the mean and standard deviation of the chronological age, age of menarche and gynecological age, anthropometrics variables and basic physical qualities. The table 2 presents the correlation coefficient (r) found among the gynecological age with the anthropometric variables and basic physical qualities, as well as the value of p, indicating if it was significant or not for a p <0,01.

Table 1 - Mean and standard deviation of the gynecological age, age of menarche, anthropometrics variables and basic physical qualities.

N = 164	Mean and Standard Deviations
Chronological ages	14,17ÿ1,47
Age of menarche	12,23ÿ1,20
Gynecological age	1,92ÿ1,32
Body mass (Kg)	50,98ÿ8,37
Stature (cm)	159ÿ6,31
BMI (Kg/mÿ)	20,00ÿ2,95
% fat	23,63ÿ4,67
Fat mass (Kg)	12,35ÿ4,29
Thin mass (Kg)	38,61ÿ4,66
Endomorphy	4,31ÿ1,19
Mesomorphy	3,75ÿ1,31
Ectomorphy	3,11ÿ1,46
Explosive strength (cm)	31,05ÿ4,58
Velocity (s)	9,35ÿ0,82
Relative VO2 mÿx (ml.Kg-1.min-1)	38,68 **4,30**

Table 2 - Correlation of the gynecological age with the anthropometrics variables and basic physical qualities

N = 164	*r*	*p*
Massa corporal (Kg)	0,307	0,000*
Estatura (cm)	0,060	0,400
IMC (Kg/mÿ)	0,312	0,000*
% gordura	0,296	0,000*
Massa gorda (Kg)	0,302	0,000*
Massa magra (Kg)	0,274	0,000*
Endomorfia	0,274	0,000*
Mesomorfia	0,217	0,000*
Ectomorfia	-0,305	0,000*
Forÿa explosiva MMII (cm)	0,220	0,005*
Velocidade (s)	-0,056	0,479
VO2 mÿx relativo (ml.Kg-1.min-1)	-0,393	0,000*

* Correlation adopting p<0,01

DISCUSSION

According to Tanner (1990), in the premenarche period happens the largest transformations of the puberty. However, the results presented in the table 2 demonstrate the importance of the postmenarche period in the anthropometry and basic physical qualities of pubescent.

Castilho and Barros Filho (2000) describe that the pick of speed of the stature it happens before the menarche, having little growth after this period. This seems to be the most plausible explanation for the low value of r found between the gynecological age and the stature (table 2).

In the other anthropometrics variables, the values of r were positive and just moderate, however, the correlations were significant (table 2). This way, it is observed that the body mass, possibly stimulated by the increases of the thin mass, of the% of fat and consequently of the fat mass tends to increase in the postmenarche period.

Among the studies that used school no athletes in the puberty for us to accompany alterations in those anthropometrics variables, the longitudinal study of Biassio, Matsudo and Matsudo (2004) used the menarche as reference of sexual maturation, finding significant differences in the body mass and in the sum of 7 skinfolds, among the periods year of the menarche, 1 year postmenarche and 2 years postmenarche. Besides, the studies that used the chronological age told an evolution of the body mass of the 10 to the 17 years (LOKO, et al., 2000) and of the 11 to the 15 years (FARIAS and SAVIOR, 2005).

In addition, the studies that used BMI demonstrated increase during all the puberty (VITALLE et al., 2003; BIASSIO, MATSUDO, MATSUDO, 2004), corroborating our study that also verified the increase tendency.

The correlations, although moderates, were positives and significants in the endomorphy and in the mesomorphy (table 2), seeming be stimulated by the increases of the body fat and of the thin mass, respectively. The ectomorphy, however, presented a correlation moderate, negative and significant. Malina and Bouchard (1991) describe the increase of the endomorphy, stability of the mesomorphy and decline of the ectomorphy along the maturation, while Guedes and Guedes (1999) analyzed girls of the 7 to the 17 years of age and they verified increase of the endomorphy, decrease of the mesomorphy and tendency of decline of the ectomorphy. This way, seems that the different results found in the component mesomorphy are related to the different methodologies of the analyzed studies.

With regard to the basic physical qualities, the results showed moderate positive and significant correlation with the explosive strengh of members inferior, weak negative correlation with the speed and moderate negative and significant correlation with VO2máx relative(tabela 2).

The study of Biassio, Matsudo and Matsudo (2004) showed an evolution of the muscular strengh of inferior members in the periods before, during and after the menarche, also using the vertical jump. The study of Loko et al. (2003) shows that the behavior of the results obtained with athletes and no athletes are different, in other words, the evolution presented by the athletes' sample in the puberty was superior to the no athletes with the progress of the chronological age. In short, in the period postmenarche, this basic physical quality presents evolution, being larger in athletes.

When analyzing the speed in young athletes, the study of Loko et al. (2000) display an evolution of the speed to the 13 years of age, presenting stability later. Like this, when analyzing the medium age of the menarche of this study (table 1), seems that in the period postmenarche the speed tends the if it stabilizes.

The studies of Ulbrich et. al (2007) and Freitas et. al (2003) evaluated biological maturation through the five apprenticeships of sexual maturation and of the bone maturation, respectively, using STR-20 to evaluate relative VO2máx, and they verified a decline of this physical quality during the puberty. Mota's et al study. (2002) it also showed through STR-20 that girls less mature present results superiors the more mature, still verifying, that the percentile fat influences in this process. In adition, the study of Bôhme et al. (2004) also describes the negative influence of the adiposity in relative VO2máx of pubescent.

This way, observing that relative VO2máx is calculated in function of the body mass, seems that the increase of this variable anthropometric in the period postmenarche, with prominence to the specific increase of the fat massis associated to the decline of relative VO2máx in this phase of the life.

CONCLUSIONS

The gynecological age presented relationship with anthropometrics variables and basic physical qualities, showing that it can be taken advantage in the school to evaluate the sexual maturation. Finally, although the correlations are moderate, a tendency of increase of the corporal mass, BMI, was evidenced percentile of fat, thin mass, fat mass, endomorphy, mesomorphy and explosive force of inferior members, besides a decline of the ectomorphy and of relative VO2máx. However, the weak correlations evidenced that there are no great alterations in the stature and in the speed in advance of the gynecological age.

This way, suggests that new studies are accomplished, with preference for the longitudinals, using the gynecological age as method of evaluation of the sexual maturation to accompany the somatic and motor development in the period powder-menarca.

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THE GYNECOLOGICAL AGE AND ITS RELATION WITH ANTHROPOMETRICS VARIABLES AND BASIC PHYSICAL QUALITIES OF SCHOOLS

The gynecological age can be an important resource to evaluate the somatic and motor development in the period powder-menarca. This way, the objective of this study was to evaluate the relationship of the gynecological age with variables anthropometrics and pubescent no-athletes' basic physical qualities. The sample consisted of 164 young females with age among 10 and 16 years that obeyed the inclusion criteria. The date of the menarca and the chronological age were obtained through an anamnesis, making possible the calculation of the gynecological age. The variables anthrpometrics in study were the body mass, stature, body mass index (BMI), fat percentage, thin mass, fat mass and components of the somatotype. The basic physical qualities were the explosive force of inferior members, velocity and VO2máx. The average and the standard deviation were used to describe the data, following by the correlation of Pearson to identify which varied if they relate with the gynecological age. Positive and significant correlations (p <0,01) they were found in the variables body mass, BMI, fat percentage, thin mass, fat mass, endomorphy, mesomorphy and explosive force of inferior members. Negative and significant correlations (p <0,01) they were found in the variables ectomorphy and VO2máx. It is ended that in the period post menarche there is the tendency of increase of the body mass, BMI, fat percentage, thin mass, fat mass, endomorphy, mesomorphy and explosive force of inferior members; a tendency of decline of the ectomorfia and of relative VO2máx; not having significant alterations in the stature and speed.

Key words: menarche, sexual maturation and puberty

L'ÂGE GYNÉCOLOGIQUE ET SON RAPPORT AVEC VARIÁVEIS ANTROPOMÉTRIQUE ET QUALITÉS PHYSIQUES DE BASE D'ÉCOLE

L'âge gynécologique peut être une ressource importante pour évaluer le somatique et développement du moteur dans le période apés la menstruation. Em face de cella, l'objectif de cette étude a été évaluer le rapport entre l'âge gynécologique avec des variables antropométrique et les qualités physiques basiques des púberes nom athlètes. L'échantillon a consisté en 164 filles avec âge parmi 10 et 16 années qui ont obéi aux critères de l'inclusion. La date du menstruation et l'âge chronologique a été obtenue à travers d´une anamnèse, en rendant possible le calcul de l'âge gynécologique. Les variables anthrpometrics dans l´étude étaient la masse du corp, taille, index de masse corps (IMC), le pourcentage de graisse, la masse mince, la masse grasse et composants du somatotype. Les qualités physiques de base étaient la force explosive de membres inférieurs et VO2máx. La mesure et le détour étalon ont été utilisées pour décrire les données, en suivant par la corrélation de Pearson pour identifier quelles variables ont lieson avec l'âge gynécologique. Corrélations positives et considérables (p <0,01) ont été trouvés dans les variables la masse du corps, IMC, pourcentage de graisse, masse mince, masse grasse , endomorphy, mesomorphy et force explosive de membres inférieurs. Corrélations négatives et considérables (p <0,01) ont été trouvés dans les variables l'ectomorphy et VO2máx. La conclusion est que dans le période aprés la menstruatio il y a la tendance d'augmentation de la masse du corps, IMC, pourcentage de graisse, masse mince, masse grasse, endomorphy, mesomorphy et force explosive de membres inférieurs. Une tendance de déclin de l'ectomorfia et de VO2máx relatif; n'ayant pas modifications considérables dans la taille et vitesse.

Mots de la clef: menarque, maturation sexuelle et puberté

LA EDAD GINECOLÓGICA Y SU RELACIÓN CON VARIABLES ANTROPOMÉTRICAS Y LAS CALIDADES FÍSICAS BÁSICAS DE ESCUELA

La edad ginecológica puede ser un recurso importante para evaluar el desarrollo somático y de motor en el período polvo-menarca. De ésta manera, el objetivo de este estudio fue evaluar la relación de la edad ginecológica con los variables anthropométricas y las calidades físicas básicas de las pubescentes. La muestra consistió en 164 muchachas con la edad entre 10 y 16 años que obedecieron el criterio de la inclusión. La fecha del menarquia y la edad cronológica se obtuvo a través de un anamnesis, mientras haciendo posible el cálculo de la edad ginecológica. Las variables en el estudio eran la masa del cuerpo, la estatura, el índice de masa de cuerpo (BMI), porcentaje de gordura, masa delgada, masa gorda y componentes del somatotipe. Las calidades físicas básicas fueron la fuerza explosiva de miembros inferiores y VO2máx. Fueron usados el promedio y la desviación normal para describir los datos, mientras siguiendo por la correlación de Pearson para identificar qué variables se relacionan con la edad ginecológica. Las correlaciones positivas y significantes (p <0,01) fueraon encontradas en la masa del cuerpo de variables, IMC, porcentaje de gordura, masa delgada, masa gorda, endomorphy, mesomorphy y fuerza explosiva de miembros inferiores. Las correlaciones negativas y significantes (p <0,01) ellos se encontraron en el ectomorphy de las variables y VO2máx. La conclusion fue que en el período polvo-menarca hay la tendencia de aumento de la masa del cuerpo, BMI, porcentaje gordo, masa delgada, masa gorda, endomorfia, mesomorfia y fuerza explosiva de miembros inferiores; una tendencia de declive del ectomorfia y de VO2máx relativo; las alteraciones significantes teniendo en la estatura y velocidad.

Palabras chave: menarquia, madurez sexual y puberdad

A IDADE GINECOLÓGICA E SUA RELAÇÃO COM VARIÁVEIS ANTROPOMÉTRICAS E QUALIDADES FÍSICAS BÁSICAS DE ESCOLARES

A idade ginecológica parece ser um importante recurso para avaliar o desenvolvimento somático e motor no período pós-menarca. Desta forma, o objetivo deste estudo foi avaliar a relação da idade ginecológica com variáveis antropométricas e qualidades físicas básicas de púberes não-atletas. A amostra constou de 164 meninas com idade entre 10 e 16 anos que obedeceram aos critérios de inclusão. A data da menarca e a idade cronológica foram obtidas através de uma anamnese, possibilitando o cálculo da idade ginecológica. As variáveis antropométricas em estudo foram a massa corporal, estatura, índice de massa corporal (IMC), percentual de gordura, massa magra, massa gorda e componentes do somatotipo. As qualidades físicas básicas foram a força explosiva de membros inferiores, a velocidade e o consumo máximo de oxigênio (VO2máx). A média e o desvio padrão foram utilizados para descrever os dados, seguidos da correlação de Pearson para identificar quais variáveis se relacionam com a idade ginecológica. Correlações positivas e significativas (p<0,01) foram encontradas nas variáveis massa corporal, IMC, percentual de gordura, massa magra, massa gorda, endomorfia, mesomorfia e força explosiva de membros inferiores. Correlações negativas e significativas (p<0,01) foram encontradas nas variáveis ectomorfia e VO2máx. Após avaliar as relações, concluiu-se que no período pós-menarca há a tendência de aumento da massa corporal, IMC, percentual de gordura, massa magra, massa gorda, endomorfia, mesomorfia e força explosiva de membros inferiores; uma tendência de declínio da ectomorfia e do VO2máx relativo; não havendo alterações significativas na estatura e velocidade.

Palavras chave: menarca, maturação sexual e puberdade.