169 - MORPHOLOGIC AGE AND MOVEMENT COORDINATION IN PRACTICING YOUTHS OF ARTISTIC GYMNASTICS

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1. INTRODUCTION

The Olympic Gymnastics is one of the older and popular sporting modalities in the Olympic program. It is a sport that stands out for the great variety of movements artificial, dynamic or static, of difficult coordination, executed in special conditions: in the apparels, where the level of the gymnasts is evaluated by a group of judges, according to the criteria of difficulty of the program, the composition and the execution quality (ANDRÉA JOÃO apud SMOLEVSKIY, 1996).

Although there still are not appropriate explanations for countless subjects related to the effects of the practice of the physical activity involving all the young population, it is verified that, in the last years, a great amount of information is being accumulated in reference to the subject. Certainly, the existent gaps area related to the fact that some programs of physical activity induce morphologic and functional modifications in the same direction of what is waited for the process of biological maturation (ROSE MARTIN apud GUEDES & GUEDES, 1995).

Garcia (1996) comments that more and more incorporation of children and young to the sport activity is observed. From the trainer to the physical education teacher, all should be conscious of the processes and morphologic changes that it brings to the children and the adolescents, and of the effects that they are put upon to the physical activity and the training, to obtain the best sport incomes, but carefully as for the children's and adolescent's health.

The present study seeks to characterize the influence of IDCM (Index of Modified Corporal Development), in the mass, in the stature and movement coordination in the practicing youths' of Olympic gymnastics of an Olympic town in the west area of the Municipal district of Rio de Janeiro.

1.2 objective: Characterization of the Index of Modified Corporal Development (IDCM), in the corporal mass, in the stature and in the movement coordination, in girls from 6 to 11 practicing of Artistic Gymnastics.

1.2.1 Specific objective 1: To describe to IDCM in the girls' corporal mass from 6 to 11 practicing of Olympic gymnastics.

1.2.2 Specific objective 2: To verify IDCM in the girls' stature from 6 to 11 practicing of Olympic gymnastics.

1.2.3 Specific objective 3: To evaluate the influence of IDCM in the result of the test of movement coordination in girls from 6 to 11 practicing of Olympic gymnastics.

1.3 variables:

1.3.1 dependent variables: corporal mass, stature and result of the coordination test.

1.3.2 independent variable: IDCM.

1.4 delimitation of the Study: Practicing female children of Artistic Gymnastics, of a sporting center, with age between 6 and 11 of the city of Rio de Janeiro.

3. LITERATURE REVISION

The growth refers to the size increase of the structure and another parts of the body; the term maturation is used to indicate the evolution of certain organ to the final maturity status. (ROSE MARTIN APUD MALINA AND BEUNEM, 1997)

In this context, in the adolescence, great biological modifications happen, in relation to the growth and to the maturation, promoting changes in the physical aspect, as well as in the individual's motor acting (ROSE MARTIN apud BASTOS and HEGG, 1989; GUEDES AND GUEDES, 1997; JONES, HITCHEN AND STRATOTON, 2000; KATZMARZYK, MALINA AND BEUBEN, 1997; MALINA, 1998).

The movement coordination is primordial for the perfect execution of the different technical abilities of the Olympic Gymnastics, and it is part of the group of the coordinative capacities. That capacity is also important for the learning of new movements and for the improvement of techniques already learned. The best phase of development of the coordinative capacities is during the childhood (up to 12 to 13 years) and it is exactly in this period that the children should have the opportunity to explore the most several movements with great variability in the corporal positions. The training of the general coordination during the period of the childhood is extremely relevant for the future development of specific abilities. (MYRIAN NUNOMURA AND VILMA LENÍ, 2005).

Nowadays, the anthropometric technique is one of the procedures of larger applicability for studies of external measures of the corporal dimensions (KELLY WHISTLES apud GUEDES and GUEDES, 1998). This method is one of the most spread and used in Brazil, because it uses low cost and simple execution equipments (KELLY WHISTLES apud LOPES and PIRES NETO,1996).

The anthropometry allows to measure the growth through the evaluation of the stature and of the corporal weight, as well as the amount and the pattern of distribution of the corporal fat through the thickness of the cutaneous folds and sum of the different anatomical areas. (KELLY WHISTLES APUD GUEDES & GUEDES, 1998; COSTA 2001)

3. METHODOLOGY

3.1. Model and Typology: This research has descriptive stamp with transverse cut and development typology, that implicates in the study of the changes in the behavior of different subjects in each age group and obtaining information concerning existent conditions, with regard to variables or conditions in a certain situation. (THOMAS and NELSON, 2002). This study is in agreement with the resolution no. 196, of October 10, 1996, in its second paragraph, that treats of the research involving human beings. A research that, individual or collectively, involve the human being, directly or indirectly, in its totality or parts of it, including the handling of information or materials.

3.2. Sample: The population of the study now presented is limited to girls of Artistic Gymnastics from 6 to 11 years - 55 girls being, 16 between 10 and 11,17 between 8 and 9 ; 19 between 6 and 7 of age of a Olympic town located in the west

area of Rio de Janeiro in the year of 2005. The presented criterion serves as delimitation of what is stipulated by this study as a population.

3.3. instruments: Scale - When determining the corporal mass and stature, a scale was used, Filizola, accurately of 100 grams and it climbs from 0 to 150 Kg. **Paquimeter -** the diameters are evaluated using a paquimeter, Rosscraft range, model Tommy 2 (made in Canada), whose variation is between 02 and 16 cm and whose graduation is of 1 mm. **Measuring tape -** When checking the circumferences, a measuring tape of flexible metal was used, Luft range, with 150 cm of length, and 0,1cm precision. **Chronometer -** accurately of second hundredths, Cássio, number MFM - 584.

3.4. Protocols: The used method was IDCM (index of modified corporal development) Siret (1991). This procedure has advantages of easy applicability, allowing to know the behavior of the sample studied regarding the three possible levels of maturation: late, normal and accelerated in relation to the biological age.

Method Description:
Female:

$$\textbf{IDCM} = \frac{0.5\,(DBA + DBC)\ X\ 0.5\,(CCD + EEC) + FC}{\text{stature (cm)} \times 10}$$

where:
DBA = Biacromial Diameter**. DBC =** Bicristal Diameter**. CCD and EEC =** Circumference of the right and left thighs.
FC - Factor of Correction, that depends on the Index of Rohrer**:**

$$\textbf{Index of Roherer} = \frac{\text{Mass corporal(g)} \times 100}{\text{Stature 3 (cm)}}$$

Female: FC = 14.8768 (Index of Roherer) +18.4472. Once obtained the value of each individual's IDCm, they are used the following regression equations, elaborated by Siret and Pancorbo (1991), for both sexes:
Female = 0.4015 x Edec + 9.5469 x IDCm - 0.5586
where:
Id.dec = Decimal Age
IDCm = Index of Modified Corporal Development. Once obtained the results of the calculation of IDCm, it is significant to know the behavior of the sample studied regarding the three possible levels, when the girl has maturation late, normal and accelerated regarding her biological age.
- If Individual IDCm is larger than: X + S his maturation is accelerated.
- If the IDCm is equal to X + S his maturation is normal.
- If the DCM is smaller than X + S his maturation is late.

where:
X = average
S = standard deviation.

3.5 Statistical treatment: The use of techniques of the Descriptive Statistics sought to characterize the researched population. The basic statistical parameters were preceded, as: average, standard deviation, maximum and minimum values.

4. RESULTS PRESENTATION AND DISCUSSION

Table-1 - Average and standard deviation of the age, corporal mass, stature and result of the Burpee test in the late, normal and accelerated morphologic moments in the girls born between 1994 and 1995, 1996 and 1997, 1998 and 1999.

YEAR-94/95	LATE	NORMAL	ACCELERATED
N	5	6	5
AGE	10,5±0,69*	10,3±0,31	10,1±0,48
MASS	29,1±5,59	34,2±5,34	36,8 ±8,79
STATURE	134,4±2,62	139,9±9,81	142,9 ±6,87
COORD	4,4±0,55	4,5±1,05	4,2 ±1,1
YEAR-96/97	LATE	NORMAL	ACCELERATED
N	10	4	3
AGE	8,5±0,43	8,8±0,55	10,1±0,48
MASS	28,5±7,34	28,1±6,73	35,8±9,69
STATURE	130,4±4,16	130,4±11,33	139,9±9,81
COORD	4,4±0,97	4,8±0,5	4,2±1,1
YEAR-98/99	LATE	NORMAL	ACCELERATED
N	6	8	5
AGE	6,4±0,39	6,1±0,45	6,2±0,53
MASS	21,6±2,5	21,1±4,71	22,9±2,93
STATURE	118,8±4,67	118,9±3,67	134,4±2,62
COORD	4,4±0,55	4,2±0,75	4,4±0,14

*** Average and standard deviation**

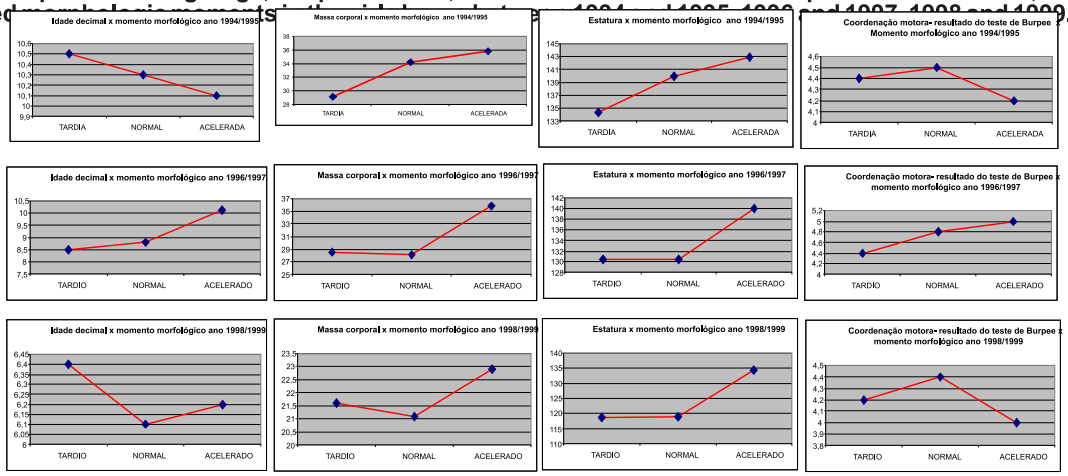
In the table-1 it is evident the tendency of elevation of the corporal mass in the girls of accelerated morphologic maturation presenting the largest values. 36,8 kg for the groups 94 and 95; 35,8 Kg for the groups 96 and 97; 22,9 Kg for the groups 98 and 99, evidence that indicates the influence of the accelerated morphologic maturation in the increase of the corporal mass.

The stature of the girls' groups accelerated also suffers elevation tendency presenting the largest values. 142,9 cm for the groups 94 and 95; 139,9 for the groups 96 and 97; 134,4 for the groups 98 and 99, evidence that indicates the influence of the accelerated morphologic maturation in the increase of the stature.

The result of the Burpee test followed the decrease tendency mainly in the groups 94 and 95; 96 and 97 with medium result of 4,2 executions in both groups, indicating the influence of the accelerated morphologic maturation as soon as can harm the result of the test.

The graph 1 illustrates those characteristics and it facilitates the visualization of the tendencies of the group.

Graph-1 - Average age, corporal mass, stature and result of the Burpee test in the late, normal and accelerated morphologic moments in the girls between 1994 and 1995, 1996 and 1997, 1998 and 1999.



5. CONCLUSIONS AND RECOMMENDATIONS

The true Russian mountain that represents the biological maturation deserves the health professionals special attention, especially of Doctors and of Physical Education teachers.

In the groups of same age group the larger and heavier youths are part of the groups of accelerated morphologic maturity. These youths, therefore can have their prescriptions focused in physical qualities, mainly resistance and force.

Enlarging the glance for whole the studied group, it is evident the need of attention to the girls of accelerated morphologic maturation, in function of the decrease tendency in the result of the Burpee test - movement coordination. Like this, after the evaluation of the results of the tests, we especially indicated for the girls of accelerated maturation, the prescription of exercises that stimulate the development of the movement coordination. This action contributes in the formation of the active lifestyle of these young ones, and it increases the possibility of future great performances.

We recommended the evaluation of the somatotipo, of the genetic marks - dermatoglifia and of other tests of basic physical qualities as resistance, speed, forces, agility, flexibility and movement coordination in the intention of describing the relationship of the morphologic maturation in these varied in scholars and in the several individual and collective sports. We still recommended the correlation with the sexual maturation and hand and fist RX.

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MORPHOLOGIC AGE AND MOVEMENT COORDINATION IN PRACTICING YOUTHS OF ARTISTIC GYMNASTICS

Summary: The objective of this study is to describe IDCM, using anthropometric and coordinative variables. Having 55 female children participated of the study with age among 6 and 11 years, apprentices of artistic gymnastics on a sporting center of the city of Rio de Janeiro. Descriptive research. In the sample the index of modified corporal development was evaluated Siret (1991) and for the verification of the coordinative variable the test was used Burpee. The accelerated maturational moment is usually marked by larger stature and corporal mass, however this increase was not found in the result of the coordination test. We recommend studies about the relationship between IDCM and physical qualities in several individual and collective modalities.
UniTerms: Morphologic Maturation, Movement Coordination, Artistic Gymnastics, Burpee test.

IDADE MORFOLÓGICA E COORDENAÇÃO MOTORA EM JOVENS PRATICANTES DE GINÁSTICA ARTÍSTICA

RESUMO: O objetivo deste estudo é descrever o IDCM , através de variáveis antropométricas e coordenativas. Participaram do estudo 55 crianças do gênero feminino com idade entre 6 e 11 anos, praticantes de ginástica artística de um centro esportivo da cidade do Rio de Janeiro. Pesquisa descritiva. Na amostra foi avaliado o índice de desenvolvimento corporal modificado Siret (1991) e para a verificação da variável coordenativa foi utilizado o teste de.Burpee. O momento maturacional acelerado é marcado por maior estatura e massa corporal, porém este aumento não foi encontrado no resultado do teste de coordenação. Recomendamos estudos sobre a relação da IDCM com qualidades físicas em diversas modalidades individuais e coletivas.
Unitermos: Maturação morfológica, Coordenação motora, Ginástica artística, Teste de Burpee.

Résumé: L'objet de cet étude est décrire l' IDCM, les variables antropométriques et coordinatives. Cet étude comprenait la participation de 55 jeunes filles, de 6 à 11 ans, toutes elles pratiquantes de gymnastique artistiqe, à un centre sportif situé à Rio de Janeiro. Recherche descriptive. L'évaluation de l'échantillon indiquait l'index de développement corporel modifié Siret (1991). Le test de Burpee fut employé pour la verification de la variable coordinative. Le moment de maturité accélerée reste indiqué par une stature plus haute et une majeure masse corporelle, cet augmentation, néanmoins, n'était pas réfléchie au résultat du test de coordination. Il est recomandable promouvoir des études concernantes à la relation de l' IDCM avec les caractéristiques physiques en modalités sportives diverses, soient elles de caractère individuel ou bien collective.