13 - ANTROPHOMEDICAL ANALYZE OF THE STATE HANDBALL FEMALE CHAMPION TEAM OF MATO GROSSO DO SUL- 2007

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Introduction

According to Teplov apud Fernandes Filho (1999), the talent doesn't pre-determine the success, but, it is the condition to its realization. And one of the ways to make this talent selection is through genetical characteristics.

Despite the sports practice is open to everybody, only some players that have some and specific skills will be able to reach great results. Handball athletes, besides their athletics abilities must have morphological qualities working on a maximum mobility in all the meanings, to respond to the demands in different situations of the game. (BAYER, 1987). Besides, due to the training that the athlete is submitted, he acquires certain characteristics that make him different from the regular population and the other sports (PIRES NETO, 1986). So, handball is a modality that requires certain specific characteristics.

It is important to set the profile of the sport, to get a correct evaluation, and not only to work with tables raised to a normal population (MARINS & GIANNICHI, 2003). Yet in the sport, employment of somatotype represents an important strategy to detect the athlete profile in the modality, and guide the kind of training that must be employed (MCARDLE et al., 2003; MARINS & GIANNICHI, 2003; CARTER, 1975).

The elite athletes' antrophomedical, neuromuscular, physiological characteristics from several modalities are, most of times, very different, in as much as the specific demands of each sport. Many of these characteristics are modulated by the heredity, by the physical training, by nutritional aspects, among other factors that can contribute a lot for the success, mostly in the high performance sports (GOBBO et al., 2002), assuring Pires Neto's idea (1986), that each athlete is differentiated from the regular population and the other sports.

The body composition has been analyzed nowadays through anthropometrical measures which include height, body mass, skin folds, lengths and diameters, and those data are so, employed to prescribe the treatment through changes in these body components. The identification of all the variables quoted above is of unquestionable importance for a suitable training prescription, because the simple identification of the body mass has sometimes little meaning to the athlete population. Because an individual can have body mass with the index considered normal and to have fat accumulated and reduction of flesh, the same way, practitioners athletes of sport modalities that demand strength can have excessive body mass when, in fact, the body mass reflects a great muscular development and not fatness accumulation(FONSECA et al.,2004).

Considering that the handball in Mato Grosso do Sul has being more and more practiced in schools, this study sought as its objective, to present a model of antrophomedical structure to the performance of the State Champion Team of female handball of Mato Grosso do Sul.

Methods

This essay characterizes as a descriptive survey, with co relational analyze of the variable anthropometrical related to the game position. The analyzed sample was twelve handball athletes, from fifteen to seventeen years old, female, the State Champion Team in Campo Grande MS 2007.

It was collected the following variables: index of body mass (IMC), triceps skin folds (TR), supra-iliac (SI), all measures in mm, body fat mass (MG), lean body mass (MCM), fat percentage (G%), ideal weight (PI), age (ID), weight (PE), height (ES), arm span (ENV), length of the lower limbs, diameter of the palms.

To determine the body mass, it was used a weighting machine- scale of brand “Filizola”, with precision for 100g. To the height, it was used a wall with scale graduated in centimeters. From those weight and height measures, it was calculated the index of body mass, where the body weight is divided by the square of the height.

To obtain the fatness mass, lean body mass and the ideal weight, it was used the following formulas where the one to calculate the fatness mass used the percentile of the fat divided by one hundred, the result obtained was multiplied by the body weight. The lean body mass is calculated through the weight body subtracted from the fatness mass. The ideal weight is calculated through the lean mass divided by zero dot seventy five (0.75), for women.

The skin folds thickness was measured with a bar of skin folds, with precision of 0.1mm, measured in the direct, with mark of the anatomical points of repair with demographic pencil, according to the technique described by Pollock and Wilmore (1993). It was done three sequential measures at the same place, and it was considered the average of the three as values adopted to this anatomical region (triceps and supra-iliac). It was used the Lohman protocol (1986) where: G%=1.35 (TR+sb)-0.012 (TR+SB)2 C*.

It was used the descriptive statistics (average and standard deviation). Related to the statistical treatment of the information, was used the descriptive statistic to group the results in values of average, standard deviation, what characterized the studied sample according to the variables selected, that sought final conclusions about the anthropometrical and the presentation of the collected data from the State Champion team of the Games of the State of Mato Grosso do Sul.

The current assignment answers to the “regulatory guidelines and standards of the survey involving the human beings” from the Resolution number 196, from October 10th , 1996, from the National Council of Health.

Resulted and Discussion

In the collected data, it was observed that all the athletes are right-handed, even acting in the position where a left-handed athlete would have a better performance, right guard and right forward.

In the table number 1, are introduced the anthropometrical results, with average and standard deviation of the following variables: age (ID), height (ES), arm span (ENV), length of the lower limbs (CMI), diameter of the palms (DPA).

Table 1. Anthropometrical measures for position in the game from the Winner Handball Female Team of the State of Mato Grosso do Sul in 2007.

Position in the game	ID		EST		ENV		DPA		CMI	
	X	DP	X	DP	X	DP	X	DP	X	DP
Guard (n=4)	16,5	0,9	1,70	0,04	1,72	0,02	18,8	1	71	46,7
Forward (n=4)	16	1,1	1,65	0,04	1,67	0,03	18,2	0,6	95,2	3,5
Center (n=2)	16,5	0,7	1,58	0,02	1,59	0,07	17	0	89	2,8
Goalkeeper (n=2)	16	1,4	1,67	0,1	1,69	0,07	17,7	0,3	92	2,8

The guards' anthropometrical measures analyze, the age average among them was 16.5 years old. The height average was 1.70m, the highest player is the guard with 1.74. Girls have periods of growth that starts at nine years old and that gets stable around thirteen years old. It is said that girls reach the top of their growth at about sixteen years old (MALINA & BOUCHARD, 1991). The growth of the stature remains at a more modest pace, several years after high school (GALLAHUE, 2005). The arm span overcame the height in only 2 cm, Cercel apud by Marques (1987) says that the arm span must overcome the height in 6%. The diameter of the palms was 18.8 cm, Fischer et al (1991-92) says that the male handball players diameter of the palms must be among 24-26 cm, related to female handball it wasn't found any article about this. The average of the length of the lower limbs was 71 cm, the tallest length of the lower limbs was also in one of the guards, 1.01m, in this case there was a very high standard deviation.

Analyzing the forward anthropometrical measures (n=4), the age average among them was 16 years old. The height average was 1.65 cm; they are the shortest players of the team. The arm span average overcame the height average in only 2 cm. The forward diameter of the palms was inferior to the guards 18.2 cm, 0.6 cm shorter. The length of the lower limbs average was higher than the guards with 95.25 cm. Facing this, and the fact of the length of the lower limbs members are one of the determiners of the speed, it is believed that this is a morphological variable that can make the difference during the game performance (GLANER, 1999).

In the centers anthropometrical data, the age average among the centers was 16.5 years old. The centers height average was 1.58 cm, according to Glaner (1999), the height has a great importance to the centers. It is because the aerial pass and the pass over to the centers demand such characteristic and a great arm span, where this was only 1 cm more than the height. The diameter of the palms was inferior to the forwards and the guards with 17 cm. The diameter of the palms is extremely important to the center, because it makes the aerials moves, pass and fade away easier. The length of the lower limbs average was 89 cm.

The goalkeepers' anthropometrical data, the age average among the goalkeepers was 16 years old. According to Bayer (1987), the goalkeepers height must be around 1.75 m, the average of the goalkeepers collected data was less than the one predicted by Bayer (1987) with only 1.67 m. Bayer (1987) says also that the ideal arm span for women is 1.82 m. The arm span average overcame the height in only 2 cm, according to Marques (1987), a high height, associated to a great arm span is responsible for the goalkeeper effectiveness. This way he/she can cover a larger space in the goal, and the necessary time will be shorter to react (GLANER, 1999). The length of the lower limbs average was 92 cm, overcoming the average of the centers. The goalkeepers' diameter of the palms average was superior only to the centers.

In the table number 2, the data of the body composition of the guards, forwards, centers and goalkeepers are showed with the following variables: Weight (PE), Body mass index (IMC), Fat percentage (%G), fatness mass (MG), lean body mass (MCM) and Ideal Weight (PI).

Table 2. Analyze of the Body composition related to the State Champion Female Handball Team of Mato Grosso do Sul position in the game in 2007.

Position on the game	PE		IMC		%G		MG		MCM		PI	
	X	DP	X	DP	X	DP	X	DP	X	DP	X	DP
Guard (n=4)	68,5	3,5	22,8	1,5	23,6	3,1	15	2,2	50,7	4,2	67,6	5,6
Forward (n=4)	58	5,3	21,8	2,1	19,7	2,7	11,5	2,5	46,3	2,3	61,9	2,9
Center (n=2)	53,1	6	21,2	1,1	18,4	4,9	9,9	3,4	42,9	1	57,2	1,4
Goalkeeper (n=2)	64,3	6,2	23,4	0,8	24	1,5	15,3	0,05	48,9	3,7	65,2	5

In the guards body composition analyze, the weight was 65.8 kg. The weight gaining in girls is because a lot of increase of the fatness mass and in the height and, in smaller degree, to increase in the muscle mass. The skeleton maturation, the increase in the fatness mass and the growth of the organs contribute to the weight gaining during the adolescence (GALLAHUE, 2005).The IMC average was 22.8 kg/m2, according to the classification it is considered normal. But related to the percentile fat, the average was 23.6%, according to Lohman's table (1987) it is considered a great level, two in four players showed a reasonably high in relation to the fat percentage. The MG of the guards was 15 kg. The MCM was 50.7 kg and the PI was superior to the current weight of all the athletes, the average was 67.6 kg.

In the forward body composition analyze, the weight average was 58 kg. The IMC average was 21.8 (kg/m2) and the classification was considered normal, only one of the forwards showed overweight I. In the percentile fat the average was 19.75%, considered by Lohman (1987) classification with a great level. The MG average was 11.5 kg less than the guards com 15 kg of MG. The MCM was 46.3 kg and the PI average was 61.9 kg.

In the centers body composition analyze the weight average was 53.1 kg. The IMC average was 21.2 (kg/m2) considered normal. The %G was inferior to the other athletes, forwards and guards. The centers, are usually, the athletes that have the highest body mass values among the positions (VASQUES, 2005), which is important to make the passage of supporters of the opponent team difficult (1 X 1 situations) (MORENO, 1997). The fatness mass was also inferior to the other athletes with 9.95 kg average. The MCM had 42.95 kg as average, and the PI had 57.2 kg as average. The %G of these athletes was low in relation to the others, what differs from other studies (VASQUES, 2005; SRHOJ, 2002) which highlight that the center is used to being the one with bigger quantity of percentile fat, probably because they need to be able to assume and keep stable positions, to bear the constant contact with the defenders and fight for a favorable position.

In the goalkeepers body composition analyze, the weight average was 64.3 kg, what influences directly the speed of the displacement (THIENGO et al, 2006). The IMC average was 23.4 (kg/m2), being considered with a normal level. The percentile fat was 24%, being considered by Lohan (1987) as a great level. The fat mass average of these athletes was 15.35 kg. The MCM average was 48.95 kg and the IP had an average of 65.2 kg, Bayer (1987) considers as the ideal weight to the goalkeepers 70 kg.

Most of the variables showed are usually studied with players of the male team, what made the study difficult because of the few number of studies related to the female handball.

Related to the body mass, the guards are the heaviest, the tallest and with a bigger arm span, however, the height provides as defensive advantages, blockings, as attacking side, where the athlete can throw the ball over the opposing defense, but the arm span is proportional to the height and make that a great speed to the ball be given and the throw is stronger (MARQUES, 1987). The guards 'diameter of the palms was also bigger than the other players in other positions, and they obtained a lean body mass superior than the others. In the length of the lower limbs, was observed that the forwards had a bigger average than the others

athletes, however they are shorter than the guards. The athletes that play in the more central positions in the court are morphologically bigger in relation to the others, while the players next to the sidelines are morphologically shorter (VASQUES, 2005). Bayer (1987) highlights that these shorter players compensate their morphological inferiority with a higher speed and mobility.

Contradicting what the literature says about the centers, the height has a great importance because the aerials passes and the passes over to the centers demand such characteristic allied to a large arm span (GLANER, 1999). The centers observed are the shortest of the team and with a shorter arm span than the other athletes with a smaller hand length what makes difficult to hold and to deal with the ball, dribbles, fades, plays books and throws (FISHER, 1991; MARTINI, 1980).

The goalkeepers were the players that showed a greater percentile fat and a greater fatness mass. The height average was 1.67. Fisher et all. (1991) says that it is difficult to claim what is the kind of the ideal goalkeeper, however, says that the performance depends on morphological qualities, I mean, high height, large length of the lower limbs, a large arm span and a large diameter of the palms. According to Marques (1987), a high height, associated to a great arm span is responsible for the goalkeeper effectiveness. Like this he can cover a bigger space in the goal, and the time necessary to react will be shorter.

Conclusion

The current study can conclude that the evaluated team showed the following variables: short arm span in relation to the height. Related to the hand breadth and in the length of the lower limbs, it was found few studies that indicate the medium value in the female handball. Related to its classification the IMC had a normal level. The fat percentage, according to Lohman (1987), all the players were in a great level. The centers were the ones who showed lower fatness mass and lower lean body mass.

Glaner (1996) says that the guards and forwards are the game positions that the most differ among themselves, and the centers tend to be the highest athletes, and the forwards the shortest ones.

Contrary to this, the positions that are more different morphologically among the rest of the team, are the guards and the centers. These were very below, mainly in the height, arm span, hand breadth, weight, fat percentage, fatness mass, and lean body mass.

To have a better performance in the female handball in Mato Grosso do Sul, it is need that the coaches take into consideration the morphological profile of each athlete and analyze in which position this fits best.

I hope that this survey makes more professionals in the area to work on scientifically essays with the female handball.

What restricted the study a lot were the few information and few surveys related to the female handball. Most of the articles researched bring information about the variables: height, arm span, hand breadth and length of the lower limbs, lean and fatness body mass and percentile fat in the male handball, becoming difficult to make comparisons to discuss the analyze of the data.

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ANTROPHOMEDICAL ANALYZE OF THE STATE HANDBALL FEMALE CHAMPION TEAM OF MATO GROSSO DO SUL- 2007

Abstract: The study seeks to present a structure model to the handball performance of the State Champion Team of Female Handball of Mato Grosso do Sul, with the objective to carry out anthropometric analysis. Twelve athletes were measured at the average of 16 (ID), 16,5 years old; weight (PE) 68,5 kg; hight (ES) 1,70 m; arm span (ENV) 1,72 m; hand breadth (DPA) 18,8 cm; lower limbs length (CMI) 71 cm; body mass index (IMC) 22,8 kg/m²; fat percentage (%G) 23,6%; body fat (MG) 15 kg; lean body mass (MCM) 50,7 kg and ideal weight (PI) 67,6 kg. Glaner (1996) assures that the backcourts and wingers are the game position which are more differentiated between them, and the pivots and backcourts tend to be the tallest athletes, and the wingers of less height. When comparing the athletes by game position, it was noticed that the backcourt and the pivots were the ones who most distanced morphologically between them. What most delimited the study were the little information and little research on female handball. The majority of the searched articles bring information on the variable: height, arm span, hand breadth and lower limbs length, lean and fat body mass and body fat percentage of male handball, making difficult to compare for the discussion of the data analysis. For a better performance in female handball in Mato Grosso do Sul, it is necessary that the technicians take into consideration the morphologic profile of each athlete and analyze in which position they fit better. And may this research stimulate more professionals in the field to carry out scientific works with female handball.

Keywords: anthropomrty; handball; athletes

L'ANALYSE ANTHROPOMÉTRIQUE DE L'ÉQUIPE CHAMPIONNE DE L'ÉTAT DE HANDBALL FÉMININE DE MATO GROSSO DO SUL

Résumé L'étude il cherche présenter un modèle de structure à la performance dans l'handeball avec l'Équipe Championne De l'état de Handball Féminine du Mato Grosso du Sud, avec l'objectif de réaliser de l'analyse anthropométrique. Ont été mensuré 12 athlètes avec moyenne âge de (ID) 16.16 ans; poids (PE) 60.85 kg, stature (ES) 1.66 m, envergure (ENV) 1.69 m, diamètre palmaire (DPA) 18,1 cm, longueur des membres inférieurs (CMI) 85 cm, indice de masse corporelle (IMC) 22.3 kg/m², pourcentage de graisse (%G) 21,3%, masse de graisse (MG) 13.1 kg, masse corporelle maigre (MCM) 47.7 kg et pèse idéal (PI) 63.5 kg. Glaner (1996) affirme que les armateurs et les extrêmes sont les positions de jeu qui plus se différencient entre soi, et les pivots et les armateurs tendent être les athlètes de plus grande stature, et les extrêmes de moindre stature. À la comparaison les athlètes par position de jeu, ont est remarqués que les armateurs et les pivots ont été ce qui plus se sont éloignés morphologiquement entre eux. Ce qu'a délimité beaucoup l'étude, ont été les peu d'informations et peu de recherches avec l'handball féminine. À la majorité des articles cherchés apportent des informations sur les variables: stature, envergure, diamètre palmaire et longueur des membres inférieurs, de la masse corporelle maigre et grosse et de la pourcentage de graisse de l'handball masculine, en rendant difficile la comparaison pour la discussion de analysent des données. Pour qu'il y ait un revenu dans l'handball féminine dans le Mato Grosso do Sul, il faut que les techniciens prennent en considération le profil morphologique de chaque athlète et analyser dans quelle position celui-ci s'encaisse mieux. Et que cette recherche stimule plus professionnels du secteur à réaliser des travaux scientifiques avec l'handball féminine.

Mots clé : antropométrie ; handball ; athlète

ANÁLISIS ANTROPOMÉTRICA POR POSICIÓN DE JUEGO DEL EQUIPO CAMPEÓN PROVINCIAL DE BALONMANO FEMENINO DE *MATO GROSSO DO SUL* -2007

Resúmen: El estudio busca presentar un arquetípo a la performance en el balonmano con el Equipo Campeón Provincial de Balonmano femenino de *Mato Grosso do Sul*, con el objetivo de realizar un análisis antropométrica. Fueron mensuradas 12 (doce) atletas con média de edad de las armadoras (ID) 16,5 años; peso (PE) 68,5 kg; estatura (ES) 1,70m, envergadura (ENV) 1,72m; diámetro palmar (DPA) 18,8 cm, largo de los miembros inferiores (CMI) 71cm; índice de masa corporal (IMC) 22,8 kg/m²; porcentual de grasa (%G) 23,6%; masa de grasa (MG) 15 kg; masa corporal delgada (MCD) 50,7 kg y peso ideal (PI) 67,6kg. Glaner (1996) afirma que los armadores y extremas son las posiciones de juego que más se diferencian entre si, y los pivotes y armadores tienden a ser los atletas de mayor estatura, y los extremos, de menor estatura. Al comparar los atletas por posición de juego, se notó que las armadoras y las pivotes fueron las que más se alejaron morfologicamente entre si. Lo que mucho delimitó el estudio fueron las pocas informaciones y pocas pesquisas con el balonmano femenino. La mayoría de los artículos pesquisados traen informaciones sobre las variables: estatura, envergadura, diámetro palmar y largo de los miembros inferiores, masa corporal delgada y gorda y porcentual de grasa del balonmano masculino, complicando la comparación para la discusión del análisis de los datos. Para que haya un mejor rendimiento en el balonmano femenino en *Mato Grosso do Sul*, es necesário que los entrenadores lleven en consideración el perfil morfológico de cada atleta y analizar en cual posición este se encaja mejor. Y que esta pesquisa estimule más profisionales del área a realizar trabajos científicos con el balonmano femenino.

Palabras claves**:** antropometría; balonmano; atletas.

ANÁLISE ANTROPOMÉTRICA POR POSIÇÃO DE JOGO DA EQUIPE CAMPEÃ ESTADUAL DE HANDEBOL FEMININA DO MATO GROSSO DO SUL-2007

Resumo: O estudo busca apresentar um modelo de estrutura à performance no handebol com a Equipe Campeã Estadual de Handebol Feminina do Mato Grosso do Sul, com o objetivo de realizar análise antropométrica. Foram mensuradas 12 atletas com média de idade das armadoras (ID) 16,5 anos; peso das (PE) 68,5 kg; estatura (ES) 1,70 m, envergadura (ENV) 1,72 m, diâmetro palmar (DPA) 18,8 cm, comprimento dos membros inferiores (CMI) 71 cm, índice de massa corporal (IMC) 22,8 kg/m² porcentual de gordura (%G) 23,6%, massa de gordura (MG) 15 kg, massa corporal magra (MCM) 50,7 kg e peso ideal (PI) 67,6 kg. Glaner (1996) afirma que os armadores e extremas são as posições de jogo que mais diferenciam-se entre si, e os pivôs e armadores tendem a ser os atletas de maior estatura, e os extremas de menor estatura. Ao comparar as atletas por posição de jogo, notou-se que as armadoras e as pivôs foram as que mais se distanciaram morfologicamente entre si. O que delimitou muito o estudo foram as poucas informações e poucas pesquisas com o handebol feminino. A maioria dos artigos pesquisados traz informações sobre as variáveis: estatura, envergadura, diâmetro palmar e comprimento dos membros inferiores, massa corporal magra e gorda e porcentual de gordura do handebol masculino, dificultando a comparação para a discução da análise dos dados. Para que haja um melhor rendimento no handebol feminino no Mato Grosso do Sul, é preciso que os técnicos levem em consideração o perfil morfológico de cada atleta e analisar em qual posição este se encaixa melhor. E que esta pesquisa incentive mais profissionais da área a realizar trabalhos científicos com o handebol feminino.

Palavras- chave: antropometria; handebol; atletas.