5 - SCALE IS SYNONYMOUS OF FAT? MUSCULAÇÃO DIMINISHES OR NOT IT FAT? A literature revision.

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INTRODUCTION

The great majority of the practicing population of physical activity has the scale as reference on the increase of the fat mass, Many people worried in emagrecer, believe that the musculação confuses the emagrecimento process , therefore even so have a loss of the fat percentage, also have an increase of the lean mass, being able not to present loss of weight in the scale. (SOUZA, 2000)

With the experience and practises it in musculação rooms, it was evidenced, that when has an increase of weight in practicing pupils of musculação, independent of the reason that took this increase of weight, in some cases, this person she will be vain who supposedly has gotten fat. This is preoccupying, therefore if this individual starts if to find fat person because of the gauging in the scale, this affects its psychological one and in some cases, leading to a decline of its auto-they esteem. With this many people start to make on account proper diet or to use medicines without medical prescription.

It is clearly, that it has cases where the increase of weight mensurado in the scale, if relates to the increase of the fat mass, and if this increase will be above of the normal percentage of an individual is it man or woman, this can cause pathological problems (FETT 2002; FIELDS, 2004).

Analysis of the Fabric adiposo

The fat is a constituent of human body e, amongst others, executes the important function of energy reserve for mobilization in reply to the metabolic demands. However, the fat deposits do not consist in way uniform all of the body. The located cells of fat around of the waist and in abdome are more active metabolically that those located in the thighs and nádegas (NATIONAL INSTITUTES OF HEALTH CONSENSUS DEVELOPMENT PANEL ON THE HEALTH IMPLICATIONS OF OBESITY, 1985 apud SILVA; et al, 2002). The fat also has a function of transport of lipossolúveis vitamins (, D, and, K) and hormones. The main hormones related to the fats are the suprarenais (cortisone and sexual**)** (FETT 2002).

The fats can be classified as: saturated, mono-insaturadas and I polished-insaturadas. Depending on the type of acid present chemical linking in the greasy one. The saturated fats tend to be animal fats, and are solid to the ambient temperature. Butter, bathes, tallow and the fat of the meat are saturated fats. If some of atoms of hidrogênios will be absent and simple the common linking between carbon atoms will be substituted by a double linking, acid the greasy one will be insaturado. The insaturadas fats are liquid to the ambient temperature . Costumam to be of vegetal origin (FETT 2002).

The total fat of the body is divided in Essential fat and of Reserve. The essential fat consists of the existing fat in the heart, the pulmões, the liver, baço, the kidneys, the intestines, the muscles and rich fabrics in lipídios of the central nervous system and the óssea marrow. Therefore all the normal physiological functioning needs this fat (McARDLE, KATCH and KATCH, 2003).

Already the reserve fat is present in the fabric adiposo. The reserve of energy of the fabric adiposo approximately contains 83% of pure fat, 2% of protein and 15% of water in its structures of support (McARDLE, KATCH and KATCH, 2003).

The body contains two distinct types of fats, the brown and the white or turns yellow (FETT, 2002). Being that brown fats will count rich vascularização and presence of great amount of citocromos gifts in the mitocôndrias, conferring this coloration. The cells of this fabric are minors who of the fabric adiposo common, have polygon form and form similar compact masses the endócrinas glands. Beyond this, these lipídicas cells are loaded of gotículas in its cytoplasm and have numerous mitocôndrias (OLIVEIRA, 1999).

Fabric adiposo brown, differing itself from the fabric adiposo white in what it says respect to its bigger number of mitocôndrias and possessing the function of oxidation of lipídios to produce heat and to remove the fat in excess (MAURIÈGE and BOUCHARD, 1996 apud SILVA; et al, 2002). When stimulated for the nervous system likeable gift in the nervous terminations in lathe of the cells, it is become oxidate easily. Generating energy in heat form, much more of what in ATP form, as the white or common greasy cells (OLIVEIRA, 1999).

The fabric adiposo white (including the fabric adiposo subcutaneous and the visceral one) is much more abundant, however it has a metabolic tax very low serving as well as fat reserve, which could be mobilized by lipólise for the acid generation of greasy-free (AGL), that by its time it is used by other fabrics (FETT, 2002; MAURIÈGE and BOUCHARD, 1996 apud SILVA; et al, 2002).

In accordance with Newsholme and Leech (1985), controlled taxes of termogênese in the fabric adiposo brown could be important in "burning" the excess of energy consumed in the diet, leading to the maintenance of the corporal weight. Obesos citizens could, therefore, to suffer from a "bad functioning" of the fabric adiposo brown. Although the fabric adiposo brown is not prominent in the human being , its activity in not obesos individuals was demonstrated recently, exerting its function in "termogênese induced for the diet". Such fact could of certain form, to explain the reason of some people "to eat without getting fat". It was verified that this fabric is insignificant in obesos (MAYES, 1998 apud SILVA; et al, 2002).

Evaluation of the Corporal Composition

The evaluation of the corporal composition quantifies the main structural components of the body - muscle, bone and fat. Some protocols and devices exist to carry through the evaluation of the percentage of fat. This article will be showing, some indirect evaluations, that are: the tables of index of corporal mass (IMC), hydrostatic , ultrasonic pesagem, and mensuração of the cutaneous folds (McARDLE, KATCH and KATCH, 2003).

ANTHROPOMETRY

It is the science that studies and evaluates the size, the weight and the ratios of the human body. The antropométricas measures must be made of correct form, following a methodology defined for each type of evaluation (FERNANDES SON, 2003).

4) Index of Corporal Mass (IMC)

This table is very used for physicians and researchers, to evaluate the normality of the corporal weight. This measure better shows the corporal fat and the risks of illnesses. Based simply in the stature and the mass (weight) (McARDLE, KATCH and KATCH, 2003; FERNANDES SON, 2003).

· Mensuração: 1) to measure to the stature in (m) 2) To survey the all up weight (kg)

· Calculation: IMC = corporal mass (kg) ÷ stature (m^2)

This type of test is little trustworth in relation to the athletes, mainly those that load an additional mass of muscles, is classified as obesos or with weight excess, when they are evaluated with this method (McARDLE, KATCH and KATCH, 2003; FIELDS, 2004).

2) Hydrostatic Pesagem

This evaluation is the application, more common of the beginning of Archimedes determining the corporal volume. Where if it

calculates the corporal volume as the difference outside enters the weight (corporal mass) measured of water and the measured corporal weight during the submersion in the water (McARDLE, KATCH and KATCH, 2003).

Before carrying through these calculations, it is interesting to understand as this evaluation functions. Supondo that an individual with 60 kg weighs 2 submerged kg when in the water. Thus, in agreement with principle of Archimedes, a loss of weight of 58 kg corresponds to the weight of the dislocated water. With the water in the temperature of 4ºC if it can to easily calculate the volume of the dislocated water. 58 kg of water are equal the 58.000 cm ³ (1 water g = 1 cm ³ for volume 4ºC). The density of this person calculates as weight (mass) ÷ volume is equal the 60.000 g (60 kg) ÷ 58.000cm ³, its result is 1,0344 g/cm ³.

· Mensuração: 1) to survey the weight it are of water 2) to survey the weight inside of water 3) the water has that to be in a temperature of 4ºC

· Calculation of the Percentage of Fat: equation of Siri,

P.of Fat = (495 ÷ corporal density) - 450

· Calculation of the Mass of Fat

M. of Fat = corporal mass x % of fat/100)

· Calculation of the Corporal Weight Exempt of Gordura (PIG)

(PIG) = corporal weight - fat mass

3) Analysis of the Ultrasonic of the Fat

The ultrasound the same shows one high trustworthiness for the repeated mensurações of the subcutaneous fat in local multiples in the lying and erect positions in day. It also is used to mapear the thickness of the muscle and the fat in different corporal regions. Being thus it is valuable for the evaluation of the corporal composition of the individual, being that its cost is very high (McARDLE, KATCH and KATCH, 2003).

It evaluates the thickness of different fabrics (fat and muscles) and gets an image of fabrics deepest, such as the area of transversal cut of a muscle. Therefore the ultrasound was used in a research guided for the consumer, where it evaluated deep the adiposas layers of the thigh, thus providing, the evidence of that the widely announced treatments that use two applications of topical creams in the thighs and the nádegas for reduction of the celulite, the ultrasound proved that they had not obtained to reduce the thickness of the local fat in comparison with the control conditions (McARDLE, KATCH and KATCH, 2003).

4) Mensurações of the Cutaneous Folds

The use of the cutaneous folds with the purpose esteem the corporal fat is related with the fat in the fabric deposits adiposo directly below of the skin (subcutaneous fat). The mensurações of the cutaneous folds provide good information and meant concerning the corporal fat and of its distribution (McARDLE, KATCH and KATCH, 2003).

Segundo Fernandes Filho, (2003), the mensuração of the cutaneous folds, for being one simple technique, little onerous e, over all, for presenting high fidedignidade excellently , correlating itself with sophisticated techniques more, and has been the preferred method of the researchers in the area of the physical exercise and in the sports.

· Mensuração: an instrument is used specifies called Compass of cutaneous folds (DC) or adipômetro. The measures of verification of the DC always they are carried through of the right side of the body of evaluated, the fold must firmly be clipped with the fingers thumb e pointer, thus moving away from the fabric muscular underlying (McARDLE, KATCH and KATCH, 2003; FERNANDES SON, 2003).

The compass must be perpendicular to the DC, therefore the counter of the compass indicates the thickness of the cutaneous folds in millimeter. After the pinçamento, to expect a time of 2 the 4 second to effect the reading (McARDLE, KATCH and KATCH, 2003; FERNANDES SON, 2003). The tips of the compass will have to be the 1 cm of the gauging point, after the reading removes untied compass and later it DC (FERNANDES SON, 2003).

· Calculations: With example, the protocol of 7 will be used DC of Jackson and Pollock, 1980. Where the DC points are: to subescapular, tríceps, pectoral, axillary average, supplies-ilíaca, abdomen and thigh.

FORMULAS:

For men of 18 the 61 years

DENS = 1,11200000 - 0,00043499 (?7DC) + 0,00000055 (?7DC) ² - 0,00028826 (age)

For women of 18 the 55 years

DENS = 1,0970 - 0.00046971 (?7DC) + 0,00000056 (?7DC) ² - 0,00012828 (age)

Musculação in relation to the increase of the lean mass and reduction of the fat mass.

The musculação has a very important paper in the program of loss of ponderal weight. This physical activity has proven, in the majority of the research, to be an efficient form to increase the metabolism of rest through the increase of the lean corporal mass and to thus diminish the porcentual of corporal fat (FIELDS, 2004).

Exactly that force training they do not use fat at the moment of the exercise (only anaeróbica ATP-CP and glicólise), has a great use of lipídios between a series and another one of the exercises, because of the increased aeróbica activity, in intention to recoup the depletados anaeróbicos systems. E its metabolism remains high for some hours, thus leading an increase of the oxidation of fats (FIELDS, 2004).

Existe a called process gliconeogênese, that it is the use of fat to restitute the lost calories during the trainings. With the sped up metabolism, if it continues burning the fat for much time after the physical activity (SOUZA, 2006).

The anaeróbico exercise favors the hipertrofia of the lean mass, with this the rest metabolism remains in a higher level, favoring still more the metabolism of fat in the rest situation , in some cases the burning of fat in the rest arrives lasts twenty four hours (FIELDS, 2004).

It was since the musculação increases the lean mass. This lean mass speeds up the metabolism of 17 more than the 25 times what the fat mass. Thus being, how much bigger the muscular mass, more sped up will be its metabolism of the expense caloric. (SOUZA, 2006).

The force training also raises the secretion of the hormone of the growth. Thus facilitating the hipertrofia of the lean mass and leading to a possible increase of corporal weight, which had to the increase of the lean mass. This hormone, also increases the fat use (LIPÓLISE) in the period of following to the exercise (FIELDS, 2004).

Research of Field Carried through for Some Authors

Treuth et al. (1995) program of physical exercises after observed in women in the after-menopause reduction in the corporal fat of the intra-abdominal region involving force resistance, which consisted of exercises of musculação for inferior members, superior and trunk, per 16 weeks, frequency of 3 sessions /semana, one hour for session, increasing itself it load gradually of 50% of a maximum repetition at the beginning for about 67% in the end of the program. In this study, a reduction in the relation between the fabric adiposo intra-abdominal and the fabric adiposo abdominal subcutaneous provided evidences of that the program of force exercises propitiated a preferential use of the fabric adiposo visceral as energy source (SILVA; et al, 2002).

Ross, Pedwell and Rissanen (1995) they had analyzed the effect of the force training ally to the moderate energy restriction (deficit of 1000 kcal/day) in 14 obesas women per 14 weeks. The alterations in the corporal composition had been measured through

images for magnetic resonance and had disclosed to adiposo loss of fabric and no modification in the fabric lean. The esquelética musculatura of the inferior and superior members had been preserved. Also it had loss of all up weight. For these data, the training of force in combination with moderate energy restriction preserves the lean mass, in particular the esquelética musculatura, and the adiposity substantially is reduced (FRANCISCHI; et al, 2001).

Intense activities produce greaters calóricos expenses and rises in the metabolic tax of rest for proportional time and magnitude the intensity of the activity. The same it serves to the training with weights as verified by MELBY et al, (1993), GILLETTE et al (1994), HALTOM et al (1999), OSTERBERG & MELBY (2000). In this last study, the authors had verified fat use up to 62% above of the "normal one", exactly 14 hours after the musculação (GENTILE, 2005).

Lehmann et al. (1995), it observed considerable reduction in the total corporal fat, particularly in the abdominal region, measured for the relation waist-hip. They had observed despite the reduction in the corporal fat was not folloied by the loss of total corporal weight, giving the idea of that people with high reserves of fat "are protected" of the loss of lean corporal mass, to the measure that occurs the loss of corporal weight. In this study, the lean corporal mass increased, while the fat mass, particularly the abdominal fat, diminished (SILVA; etal, 2002).

CONCLUSION

According to referenciados authors above, one concludes that through the evaluation of the corporal composition, the percentage of corporal fat can be surveyed better. Clarifying as soon as the increase of weight surveyed in the scale in individuals that practise musculação, it corresponds in some cases the hipertrofia of the lean mass through the force training. The Had one to this exercise of force, the hormone of the growth is liberated that contributes in the hipertrofia of the lean mass and in the metabolism of the fat during the rest, therefore in activities of high intensity, the rest metabolism remains in a higher level, thus favoring still more the fat metabolism. However, if it cannot forget the diet, therefore it is of extreme importance for bigger loss of the fat mass, interacting with force exercise.

REFERÊNCIA BIBLIOGRAFICA

CAMPOS, MAURÍCIO DE ARAUJO. Musculação: diabéticos, osteoporóticos, idosos, crianças e obesos - Rio de Janeiro: 3º edição: Sprint 2004

FERNANDES FILHO, JOSÉ. A prática da avaliação física: testes, medidas e avaliação física em escolares, atletas e academias de ginástica **-** Rio de Janeiro: Shape, 2003. 266 p.

FETT, CARLOS. Ciência da Suplementação alimentar **-** Rio de Janeiro: 2º edição: Sprint, 2002

FRANCISCHI, RACHEK PAMFILIO. Exercício, Comportamento Alimentar e Obesidade: revisão dos efeitos sobre a composição corporal e parâmetros metabólicos **-** Rev. paul. Educ. Fís., São Paulo, 15(2): 117-40, jul./dez. 2001

LEHMANN, R. et al. Loss of abdominal fat and improvement of the cardiovascular risk profile by regular moderate exercise training in patients with NIDDM. *Diabetologia,* New York, v.38, p.1313-1319, 1995.

MAURIÈGE, P.; BOUCHARD, C. Trp64Arg mutation in b3-adrenoceptor gene of doubtful significance for obesity and insulin resistance. *The Lancet*, New York, v.348, p.698-699, 1996.

MAYES, P.A. Transporte e armazenamento de lipídeos. In: MURRAY, R.K. et al. *Harper*: Bioquímica, 8.ed. São Paulo , Atheneu, 1998ª p.254-270.

McARDLE, W.D.; KATCH, F.I.; KATCH, V.L. Fisiologia do Exercício: energia, nutrição e desempenho humano **-** Rio de Janeiro: 5º edição: Guanabara Koogan, 2003.

NATIONAL INSTITUTES OF HEALTH CONSENSUS DEVELOPMENT PANEL ON THE HEALTH IMPLICATIONS OF OBESITY. Health Implications of obesity. *Annals of Internal Medicine,* Philadelphia, v.103, p. 1073-1077, 1985.

NEWSHOLME, E. A.; LEECH, A.R. *Biochemistry for the medical sciences*. J. Wiley & Sons, 1985.p.93-166.

OLIVEIRA, CLAUDIA P.M.S. Revista de Nutrição e Saúde: gordura marrom **-** FUGESP - Fundação Médico-Cultural de Gastroenterologia e Nutrição de São Paulo, 1999.

ROSS, R.; PEDWELL, H.; RISSANEN, J. Response of total and regional lean tissue and skeletal muscle to a program of energy restriction and resistance exercise**.** International Journal of Obesity, London, v.19, p.781- 7, 1995.

SILVA, JOSÉ LUCIANO TAVARES. Obesidade Centrípeta e Disfunções Metabólicas: patogenia, mensuração e papel profilático do exercício físico **-** Semina: Ciências Biológicas e da Saúde, Londrina, v. 23, p. 49-66, jan./dez. 2002.

TREUTH, M.S. et al. Reduction in intra-abdominal adipose tissue after strength training in older women. *Journal of Applied Physiology*, Bethesda, v.78, n.4, p.1425-1431, 1995.

GENTIL, PAULO. Emagrecimento e Musculação **-** Revista Saúde e Movimento - Copyright © 2003.

SOUZA, VALERIA ALVIN IGAYARA. AFINAL, A MUSCULAçãO EMAGRECE OU NãO? AUMENTA OU DIMINUI O PESO? **-** Cyber Diet, 2000.

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ABSTRACT

The study it is based on literature revision, with objective to try to clarify the possible increases of weight, mensurados in the scale for individuals that practise musculação. The presented topics had been: analysis of the fabric adiposo, methods for the evaluation of the corporal composition and training of force. The objective of this article and to demonstrate that the increase of weight surveyed in the scale in individuals that practise musculação, in some cases it must to the increase of the lean mass and not of the fat mass.

Keywords: Corporal composition, Anthropometry, force training.

RÉSUMÉ

L'étude il est basé sur révision de littérature, avec objectif d'essayer éclaircir les possibles augmentations de poids, mensurados dans la balance par des personnes qui pratiquent musculação. Les sujets présentés ont été : analyse du tissu adipeux, méthodes pour l'évaluation de la composition corporelle et formation de force. L'objectif de cet article et démontrer que l'augmentation de poids examiné dans la balance dans des personnes qui pratiquent musculação, dans quelques cas c'est dû à l'augmentation de la masse maigre et non de la masse grosse.

Mot clé: Composition corporelle, Anthropométrie, formation de force.

RESUMEN

El estudio se basa en la revisión de la literatura, con objetivo para intentar para clarificar los aumentos posibles del peso, mensurados en la escala para los individuos que practican musculação. Los actuales asuntos habían sido: análisis del adiposo de la tela, métodos para la evaluación de la composición corporal y entrenamiento de la fuerza. El objetivo de este artículo y demostrar que el aumento del peso examinado en la escala en los individuos que practican musculação, en algunos casos debe al aumento de la masa magra y no de la masa gorda.

Palabra-Llave: Composición corporal, Antropometría, entrenamiento de la fuerza.