31 - HYDRATION AND FEEDING ON PRE- AND POST-TRAINING ON AN UNIVERSITARY FEMALE VOLLEYBALL TEAM, RJ.

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INTRODUCTION

Volleyball is often referred to as *"vôlei"* in Brazil. It consists of a sport carried out on a court divided into two parts by a net, and it is played by two teams containing six players each. Its goal is to pass the ball over the net, so that the ball must touch the floor inside the adversary court, and the same must be avoided in the own court (MELHEM, 2004).

This sport modality was created in 1895 by the teacher of physical activity William C. Morgan in Massachusetts, USA. In the beginning of the last century it was spread throughout the world, being lead to Europe by American soldiers during the First World War (MELHEM, 2004; BORSARI, 1983). This sport arrived to Brazil in 1916 through The Young Men's Christian Association, and the female participation was allowed in the year of 1924 (ALMEIDA; SOARES, 2003).

In volleyball, the human organism demands high energetic expenditure and force by the upper and lower limbs (due to vertical impulsion) and trunk, as well as aerobic conditioning, so that the person can maintain itself during a game which can last until three hour (BUTLER;ROGNESS, 1983 *apud* SCHNEIDER et al, 2004).

Along a game it is noted an alternation between aerobic and anaerobic activities, occurring short periods of maximum intensity intercalated with periods of low intensity and rest moments. Volleyball influences maximum VO2 levels, lactate and lipoproteins metabolism, hormonal changes and according with its intensity and duration, it leads to physiological changes by activating the oxidative energetic system (BIESEK et al, 2005).

Therefore, good physical preparation and adequate nutritional support as well are indispensable to the athlete, seeking supply the needs of increased metabolism and oxidative stress provoked by exercise.

Adequate food consumption during periods of training, competition and post-competition provide the required substrates to sportive modality realization by macro and micronutrients, so that they can act on energy synthesis, repair and reconstitution of body tissues, as well as maintenance of body weight, body composition and functional and structural integrity of the organism (VIEBIG; NACIF, 2007).

Increasing hydric intake is also important since water is lost by the body due to sweat and other paths of water and electrolytes excretion which have the aim to maintain body thermoregulation which all can be intensified in heat and wet environments. Therefore, it is extremely important to recover the lost liquid so that dehydration, hyponatremia, hyperthermia, etc can be prevented, factors which all limit athletes' performance (VIMIEIRO-GOMES; RODRIGUES, 2001).

There are specific strategies for athletes' feeding and hydration at the moments before, during and after training and competitions that seek to improve performance. Meantime, it is observed that athletes have difficulties establishing an adequate feeding standard for each situation (BIESEK et al, 2005).

Thus, the present study aims to describe the hydration and food consumption before and after training of an universitary female volleyball team from Rio de Janeiro city.

SUBJECTS AND METHODS

In July 2008, it was carried out a descriptive cross-sectional study, from primary base, with nine female athletes aged from 19 to 26 years, all volunteers and belonging to female volleyball team from UNISUAM.

The athletes were accompanied by two students of nutrition that were participating in the project university extension Nutresporte, since June 2008. Analyses were done during training in court which happened twice a week, on Mondays and Wednesdays, from 12 a.m. to 02 p.m.

A formulary developed in July 2008 for athletes' nutritional follow-up was applied before and after training, with the goal to detect the errors in athletes' feeding and hydration for posterior nutritional orientation.

The variables analyzed in this study were: age (years), weight (kg, before and after training), food consumption before training (snack or lunch; local and time), and hydration (before, during and after training).

Data were typed, consolidated and analyzed by the software *Excel for Windows* 2007, and then explored by means of absolute and relative frequencies and measures of central tendency (mean and standard deviation) from the selected variables.

The present study was elaborated in accord with the norms from resolution 196/96 of the National Health Council which describes the "Guidelines and regulatory standards of research involving human beings (MS/FIOCRUZ, 1998)".

The athletes (n=9) showed average age of 21.9±1.7; mean height was 1.72±0.05 m and; average weights were 12.8±4.4 and 12.1±3.9 kg before and after training, respectively.

Regarding meal type, it was verified that 76.5% of athletes had a snack and 23.5% had lunch before training (Fig. 1); and, 94.2% of athletes preferred to have a snack at home and 5.8% at the canteen of the teaching institution.

Among the athletes who have lunch, 95% made it at their own residence, approximately 1h40min±0.58min before training. It was also perceived that the most consumed foods for snack were bread, cheese, milk and/or fruit. The majority had rice, beans and grilled chicken for lunch.

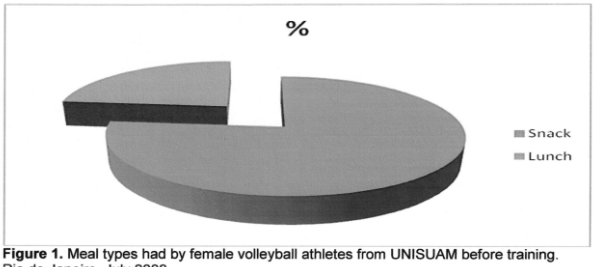


Figure 1. Meal types had by female volleyball athletes from UNISUAM before training. Rio de Janeiro. July 2008.

The beneficial effects of a balanced diet for athletes' physical performance have been well documented by literature, and when it is associated with a genetic potential and an adequate training program, it allows athlete to reach your goals (MCARDLE et al, 2003).

During training period, the diet must attend to requirements of energy and nutrients. However, the schedule and the food type which compose meals as well as hydration state should be considered in order to adjust them in function of the type of training and its duration (VIEBIG; NACIF, 2007).

It is recommended a small meal as a snack about one to three hours before training, giving preference to fruit or soy juices, white bread with jelly, and fruit with oat flour or granola (MAHAN; ESCOTT-STUMP, 2002). Carbohydrate ingestion three to four hours before training in meals containing from 140 to 330 grams increases the glycogen content in skeletal muscle and possibly hepatic glycogen, resulting in improved performance. The goal is allow the plasma insulin and glucose levels return to basal levels before that physical activity begin. However, the ingestion of carbohydrates 30 to 60 minutes before exercise could increase physical performance during a prolonged endurance exercise (BACURAU, 2005).

Regarding hydration, 69.2% of athletes hydrated themselves before the physical training; 67.3% ingested liquids during the training and; 15.7% hydrated themselves after the training (Fig. 2).

The average consumption of liquid (Gatorade, natural guarana, fruit juice or water) were 262.9119.7 mL, 60.0141.8 mL (water), and 37111.4 mL (water), respectively, before, during and after the training. These values are too lower than recommended.

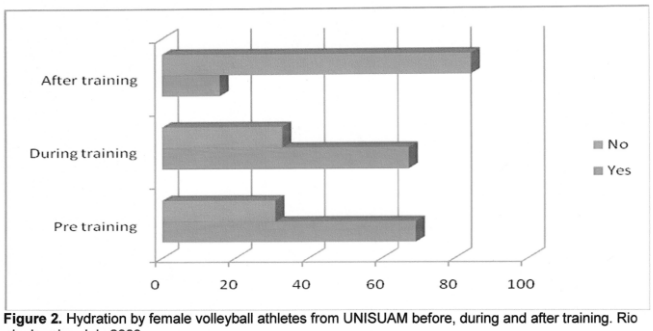


Figure 2. Hydration by female volleyball athletes from UNISUAM before, during and after training. Rio de Janeiro. July 2008.

The hydration is an extremely important factor and should be taken into account not only before physical activity, but also during and after it.

Correct hydration seeks to improve individual's performance, diminishing negative effects of dehydration. Its goal is to recover the water lost during physical activity as well as to help recovering skeletal muscle glycogen, thus improving performance and delaying fatigue (PEREIRA et al 2002).

The Brazilian Society of Sports Medicine (2003) proposed some recommendations with respect to hydration before, during and after exercise:

(1) It is recommended that an individual ingests about 500 mL of liquid during the first two hours that precede exercise to promote an adequate hydration and allow enough time for excretion of the water ingested in excess.

(2) During exercise, athletes must start drinking as soon as possible and on regular intervals, seeking consume liquid in a rate that be enough to recover all water lost through sweat, or consuming the higher amount of water tolerated.

(3) It is recommended that liquid be ingested in temperature lower than the environmental (between 15ºC and 22ºC) and with an attractive flavor.

(4) It is recommended the addition of adequate amounts of carbohydrates and electrolytes during events that last more than one hour, since it does not impair water distribution along the body and improves performance. During exercises that last less than one hour, there are few evidences showing physiologic differences in terms of performance if liquids are consumed with carbohydrates and electrolytes compared to pure water.

(5) It is recommended the addition of sodium (0.5 to 0.7 g.L-1 of water) into the rehydration solution if the exercise last more than one hour. It can be advantageous since it improves taste and also promotes liquid retention and likely revert the hyponatremia seen in some individuals that ingested excessive amount of liquid.

The goal of liquid ingestion along trainings must be to balance the lost of liquid through sweat and also to restore as liquid as possible when sweat rate is too high. It is reached by drinking small volumes (125 mL to 500 mL) regularly at intermittent intervals of about 15 min (SBME, 2003).

The fundamental physical and physiological characteristics that allow volleyball athletes to have a good performance are: high height, force, velocity, motor coordination and performance for jumps (SCHUTZ, 1990; MORROW et al, 1979). Nevertheless, without an adequate nutritional support the athlete does not reach its potential since adequate feeding and hydration before, during and after training are essential for a good physical performance in the court.

In this study, it was detected that many players during training sessions interfered in drinking water and know the importance of water consumption, especially during the training. And one of the goals of the accompanying block of athletes is to just pass correct information on nutrition and hydration before, during and after sporting activity to improve the physical performance but also there is a reduction of risks related to health such as dehydration, hyponatremia, injuries, among others.

Therefore, the errors discovered by students of nutrition were presented to athletes in simple language and careful so that there was no rejection or lack of adherence by them.

CONCLUSION

It was concluded that the athletes could achieve their meals, with food choices within what is recommended in the literature, however, does not adequately hydrated before, during and after training. The extension university project Nutresporte, has been showing a good proposal to detect errors, clarify, monitor the athletes about nutrition and hydration before, during and post-training.

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HYDRATION AND FEEDING ON PRE- AND POST-TRAINING ON AN UNIVERSITARY FEMALE VOLLEYBALL TEAM, RJ.

ABSTRACT

An appropriate feeding during training is essential to volleyball since it supplies body with required substrate for its realization in the form of micro and macronutrients. The goal of this study was to describe the hydration and feeding on periods of pre- and post-training in an universitary female volleyball team from Rio de Janeiro city. In July 2008 it was realized a descriptive, cross-sectional and with primary base study with nine female athletes, aged from 19 to 26 years old, volunteers, all belonging to volleyball female team from UNISUAM. A formulary was developed to make athlete's nutritional follow-up, and it was used by students of nutrition both before and after training. Data were typed, consolidated and analyzed by the software *Excel for Windows* 2007, as well as explored by means of absolute and relative frequencies and measures of central tendency (mean and standard deviation) from the selected variables. The athletes' average age (years) was 21.9±1.7, the mean height (m) was 1.72±0.05 and the mean body weight were 12.8±4.4Kg and 12.1±3.9Kg, respectively, at pre- and post-training periods. Regarding meal type, it was saw that before training 76.5% of the athletes have a snack and 23.5% have lunch. Among athletes, 69.2% used to hydrate themselves before physical training; 67.3% ingest liquid drinks during training, and 15.7% hydrate themselves after training. The conclusion is that the athletes do not hydrate themselves appropriately before, during and after training.

Keys-Words: Volleyball, Food Consumption, Hidratation

L'HYDRATATION ET LA CONSOMMATION ALIMENTAIRE DANS LE PRÉ ET POST-FORMATION POUR UNE ÉQUIPE DE VOLLEY-BALL UNIVERSITAIRE DES FEMMES, RJ.

RESUMÉ

En volley-ball c'est essentiel l'adéquation de la consommation alimentaire au cours de la période de l'entrainement, car elle doit fournir les éléments nécessaires pour leur réalisation, par l'intermédiaire de macro-et micronutriments. Cette étude visait décrire l'hydratation et la consommation alimentaire avant et après l'entrainement d'une équipe féminine universitaire de volley-ball, de la ville de Rio de Janeiro. Il sagit d'un étude descriptif, transversale, de base primaire, avec 9 athlètes femmes, âgés entre 19 et 26 ans, volontaires, de l'équipe de volley-ball de l'UNISUAM, au mois de Juillet 2008. Un formulaire élaboré pour le contrôle de la nutrition des athlètes a été appliquée avant et après l'entrainement par les étudiants de nutrition. Les données ont été saisies, consolidés et analysés dans le programme Excel pour Windows 2007 et son exploitation presenté par numéros absolus et relatifs, ainsi comme les mesures de tendance centrale (moyenne et écart-type) de certaines variables. Les athlètes ont montré une moyenne d'âge (en années) de 21,9 ± 1,7; hauteur moyenne (m) de 1,72 ± 0,05, et poids moyen (avant et après l'entrainement) de 12,8 ± 4 , 4 kg et 12,1 ± 3,9 kg, respectivement. En ce qui concerne le type de repas, il a été constaté que la collation est faite par 76,5% et le déjeuner par 23,5% des athlètes, avant l'entrainement. Il s'est avéré que 69,2% des athlètes s'hidrataient avant l'entraînement physique, 67,3% consommaient liquides au cours de l'entrainement et 15,7% preferaient s'hydrater après la formation. La conclusion est que les athlètes ne sont pas eux-mêmes de façon appropriée hydrate avant, pendant et après la formation.

Mots-Clés : Volley-ball, Consommation Alimentaire, Hydratation

HIDRATACIÓN Y EL CONSUMO DE ALIMENTOS EN EL PRE Y POST CAPACITACIÓN PARA UN EQUIPO DE VOLEIBOL DE LA MUJER UNIVERSITARIA, RJ.

RESUMEN

En el voleibol es fundamental la adecuación del consumo alimentício en el período de entrenamiento, pues fornece los substratos necesarios para su realización através del macro y micronutrientes. El objetivo del estudio fue describir la hidratación y el consumo de alimentos antes y después de la formación para un equipo de voleibol de la mujer universitaria, la ciudad de Río de Janeiro. Hubo un estudio descriptivo, transversal, de base primaria con 9 mujeres atletas, de edades comprendidas entre los 19 y 26 años, voluntarios, el equipo de voleibol de la mujer UNISUAM, en julio de 2008. Un formulario elaborado para la vigilancia de la nutrición de los atletas en los tribunales se aplicó antes y después de la formación de los estudiantes de la nutrición. Los datos fueron introducidos, consolidada y analizada en el programa Excel para Windows 2007, y su explotación por medio de la absoluta y relativa frecuencias, y las medidas de tendencia central (media y desviación estándar) de variables seleccionadas.Los atletas representan la mediana edad (en años)de 21,9±1,7;estatura mediana(M) de 1,72±0,05;y peso médio (antes y pos- entrenamiento) de 12,8±4,4Kg y 12,1±3,9Kg, respectivamente. Cuanto al tipo de alimento se verificó que la merienda és realizado por 76,5% y el almuerzo por 23,5%. de las atletas, antes del entrenamiento. Se detecto que 69,2% de las atletas se hidratavan antes del entrenamiento físico; 67,3% consumian liquidos durante el entrenamiento y 15,7%se referian hidratar después del entrenamiento. Se llegó a la conclusión de que los atletas no son hidratam correctamente antes, durante y después de la capacitación.

Palabras-Clave: Voleibol, Consumo alimenticio, Hidratación

HIDRATAÇÃO E CONSUMO ALIMENTAR NO PRÉ E PÓS-TREINAMENTO DE UMA EQUIPE FEMININA DE VOLEI UNIVERSITÁRIO, RJ.

RESUMO

No voleibol é indispensável a adequação do consumo alimentar no período de treinamento, pois fornece o substratos necessários para a sua realização, através de macro e micronutrientes. O presente estudo objetivou descrever a hidratação e o consumo alimentar antes e no pós-treinamento de uma equipe feminina de vôlei universitário, da cidade do Rio de Janeiro. Realizou-se um estudo descritivo, transversal, de base primária com 9 atletas mulheres, com idade entre 19 e 26 anos, voluntárias, da equipe feminina de vôlei da UNISUAM, no mês de julho de 2008. Um formulário desenvolvido, para o acompanhamento nutricional das atletas em quadra, era aplicado antes e depois do treino pelas alunas de nutrição. Os dados foram digitados, consolidados e analisados no programa *Excel for Windows* 2007, sendo sua exploração por meio das freqüências absolutas e relativas, e das medidas de tendência central (média e desvio padrão) das variáveis selecionadas. As atletas apresentaram a média de idade (em anos) de 21,9±1,7; estatura média (m) de 1,72±0,05; e peso médio (antes e pós-treinamento) de 12,8±4,4Kg e 12,1±3,9Kg, respectivamente. Detectou-se que em todas as semanas de treinamento, as atletas referiram estar dispostas ou bem dispostas para realizarem as atividades. A minoria referiu estar cansada antes do treinamento. Quanto ao tipo de refeição, verificou-se que o lanche é realizado por 76,5% e o almoço por 23,5% das atletas, antes do treinamento. Detectou-se que 69,2% das atletas se hidratavam antes do treinamento físico; 67,3% consumiam líquidos durante o treinamento e 15,7% referiam se hidratar após o treinamento. Conclui-se que as atletas não se hidratam adequadamente antes, durante e após o treinamento. Conclui-se que as atletas não se hidratam adequadamente antes, durante e após o treino.

Palavras-Chave: Voleibol, Consumo Alimentar, Hidratação.