48 - CALORIC SPENT TWO DIFFERENT RACES OF OPEN WATER

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INTRODUCTION

Swimming in open water is constantly growing and the World Cup has made great contribution to this. Currently the circuit has evidence the following distances 5 m, 10 km and 25 km, and the 10km for men and women made official by the IOC in 2008. Brazil and Australia are countries where the practice of this sport has been very popular (VANHEEST; MAHONEY; HERR, 2004). Therefore, studies for further information on the sport, has been performed in order to investigate different aspects such as: characteristics of swimmers, risks that could jeopardize the health of these athletes, and potential types of training to be undergone and environmental conditions.

Regarding the characteristics of sea swimmers evidence was investigated eight elite American athletes in open water, four men and four women and compared them to the pool of athletes, results showed that athletes in open water are smaller and lighter than swimmers pool in both genres, while setting a lower percentage of lean body mass (VANHEEST et al., 2004), corroborating study Knechtle et al., (2010) that correlated anthropometry of marathons aquatic athletes with performance data can also be observed in studies investigating swimmers and triathletes pool (DE SOUZA CASTRO et al., 2005; MILLET et al., 2002), according to Eichenberger et al., (2012), the performance of athletes in marathons aquatic is directly linked to genre, age and temperature of the water, where there is a high incidence of swimmers finished the tests with symptoms of hypothermia.

A study Brannigan et al., (2009) to investigate 35 swimmers after a race of 19.2 miles and it can be seen that 26 athletes finished the race with symptoms of hypothermia with temperatures below 35 º C, corroborating studies Nuckton et al ., (2000) noted that 11 swimmers after a sea crossing and found that 5 of these athletes had symptoms of hypothermia. In the two aforementioned studies symptoms of hypothermia demonstrated a high correlation with low Body Mass Index of athletes, however the environments that they are exposed to may have influenced these and other symptoms (GERRARD, 1999).

Studies with athletes of evidence as long ultramarathons and ironman triathlon demonstrated risk of hyponatremia in 6% of athletes surveyed (KNECHTLE et al., 2011), in a study (Wagner et al., 2012) investigated the rates of hyponatremia through collection of blood and urine of 25 male swimmers and 11 women after a marathon of 26.4 km where aquatic 8% of men and 26% of women had symptoms of hyponatremia. Men also showed a decrease in body mass and fat-free mass, as in women was not observed differences, demonstrating that gender may interfere as well as age, level of technical skill, environment and others in the energy cost in swimming (CAPUTO et al. 2006).

When the focus of analysis is the environment the sport of open water swimming pool differs by its odd conditions that will be demonstrated in the following table

Table 01.Comparison of the conditions faced by the swimmer when moving the pool and the sea

Pool	Sea
Few decision-making on the race route	The decision-making involving change of route, positioning within the squad swimmers and adjustments natural adversities.
Rays facilitate the targeting of the swimmer for a goal, that is, to arrive at one end of the pool just swim straight	The reference points for the swimmer must be constantly adapted
The water flow is stable and no currents	The flow of water is highly variable and currents may arise at any time
The water surface is laminar	The water surface is turbulent (waves)
The water is warmer and less dense, facilitating the displacement of the swimmer by reducing friction.	Lower temperatures and having a higher density as a function of the salinity of the sea offers greater resistance to displacement
Water temperature constant	Temperature susceptible to momentary variations
The tracking a reference point for the displacement (dark band on the pool floor) induces stabilization of the swimming	The reference points are located above the sea surface, thus requiring; swimmer modify its set of actions every effort to confirm your direction.
Unpredictable situations, literally nonexistent	At all times at sea can bump into structures with or without life, which can quickly lead a human being to despair of tranquility in fractions of seconds.

As not enough to odd characteristics of the natural condition presented previously, the evidence of open sea viewing the end of it is little or nothing favored thus the athlete should plan your effort to mentally distance, so one of the variables more important for performance in this type of event is the maintenance of the swimming rhythm. Thus, the endurance, which is the

ability to strive using the whole body for a prolonged period of time (Schmidt, Wrisberg, 2001) becomes a crucial component in the organization of training programs for sea crossings.

In one study Ribeiro; Galdino; Balikian, (2001), aimed to investigate the influence of swimming in the wake of another swimmer, or swim immediately behind another swimmer, to reduce lactate production and decrease in energy expenditure during the tests, 16 athletes participated in the study of both sexes, with at least 3 years of participation in a regular training program, the volunteers performed 3 tests a week, 400 to 100% for the determination of the maximum speed, the second battery tests after three days of the first 400m they swam 85% and 100% of maximum speed in an interval of 20 minutes, after they swim was measured using blood samples to check lactate concentration thereof in the third set of tests they were divided into pairs and swam at the same speeds that are now in the wake of another swimmer, and has been a decrease of 46% in the production of lactate in swimmers and triathletes consequently a reduction in energy expenditure.

However, there are limited studies that assess the caloric expenditure of open water swimmers, In a study of Zamparo et al (2005) demonstrated a high energy expenditure of the Italian national team swimmers swimming long distances in a mock trial of 2 km, the sample consisted of five swimmers males and 5 females, the mean age was 24 years, height 1.67, weight 58 kg and 18% body fat. 3 shots were made 2 km in three different speeds, which were analyzed VO2max and estimated caloric expenditure, however, the tests were performed in a pool and not in terms of specific modality.

In the study Rocha et al., (2009), 7 swimmers with mean age of 26 (± 5.8) years, participated in a marathon swimming, 23, with an average duration of 8 hours. Every 90 minutes the athletes were fed Results showed that even with constant hydration and energy, the volunteers had a significant decrease in body fat percentage and an average energy expenditure of 4781 kcal.

Based on the data presented above, this type of activity should be well supervised to avoid complications in the yield and physical integrity of practitioners.

OBJECTIVE:

Analyze the caloric expenditure of two proofs in skilled swimmers aquatic different distances.

METHODOLOGY:

The sample was composed of 34 swimmers with a mean of 26 years (8), participants of Regional and State championships open water, all athletes had at least 5 years of competitive experience. Volunteers systematically trained 5 times a week for an hour and a half, totaling an average volume of 20 km.

The volunteers were divided for analysis of energy expenditure in two trials, one group consisted of 24 swimmers, and 15 males with a mean weight of 72.31 kg (7.96) and average height of 1.75 m (1.59) and 9 females, with an average weight of 55, 41kg (3.36) and average height of 1.57 m (2.80) who swam a short proof of 2.2 km in order to speed performance, an average sea temperature 23 degrees. The second group consisted of 10 swimmers, all male, with a mean weight of 75.47 kg (6.34) and height of 1.78 m (0.03), these athletes swam a distance of 23 km at most effort for the film, during the race were made 6 stops for hydration and nutrition for athletes and was shown a table of Borg perceived exertion (Borg, 1982), where the athletes indicated the level of effort between stops, water temperature averaged 20 degrees.

For analysis of the caloric expenditure was used formula proposed by (McArdle, Katch, Katch, 2010), which takes into consideration the time of testing the strength and weight of athletes.

RESULTS:

Results are presented as mean and standard deviation descriptively.

Table 1. Estimation of energy expenditure after crossing water - 2.2 km

	Total	Female	Male
Te sting Time (Min)	38,7 (11,2)	41 (14)	32 (5,7)
Kcal Energy Expenditure(S)	620 (131)	538 (11,3)	733 (246,1)

It can be observed that the male swimmers conducted a test in a time shorter than the swimmers about 22%, even though the test time shorter than the female athletes observe a higher caloric second (CAPUTO et al., 2006) this is the smallest area of women's resistance to media, body density and anthropometric characteristics make where women have greater buoyancy compared to men.

Table 2. Estimation of energy expenditure after crossing water - 23 km

	Total
Testing Time (Min)	510(90)
Average Caloric Expenditure Kcal (S)	5346 (786)

It can be observed that the athletes had high caloric expenditure during the race which demonstrates the importance of hydration and nutrition during tests with larger distances and long term.

In the proof of 23 km was observed a large caloric expenditure on the part of athletes showing the importance of nutrition in the pre, during and post event, yet, as noted in the study (RIBEIRO et al., 2001) athletes can use the wake of another swimmer and obtain advantages such as lower lactate production and a lower energy expenditure during the competition.

CONCLUSION

The results demonstrate that this type swimmers had a great average caloric expenditure of 620 kcal in the proof of 2.2 km, and the average for the male category was 733 (246.1), the females was 538 (131), already in the race of 23 km caloric expenditure was on average 5346kcal, this study corroborates a study of Zamparo et al (2005), which showed the high energetic expense of the Italian national team swimmers swimming long distances in a simulation proof 2000m, it is very important food made by these athletes at the moments before competition, during competition and post competition.

REFERENCES:

BORG, G. A. Psychophysical bases of perceived exertion. Med Sci Sports Exerc, v. 14, n. 5, p. 377-81, 1982. ISSN 0195-9131.

BRANNIGAN, D. et al. Hypothermia is a significant medical risk of mass participation long-distance open water

swimming. Wilderness Environ Med, v. 20, n. 1, p. 14-8, Spring 2009. ISSN 1080-6032.

CAPUTO, F. et al. Intrinsic factors of the locomotion energy cost during swimming. Revista Brasileira de Medicina do Esporte, v. 12, n. 6, p. 399-404, 2006. ISSN 1517-8692.

DE SOUZA CASTRO, F. A. et al. Cinemática do nado "crawl" sob diferentes intensidades e condições de respiração de nadadores e triatletas. Rev. bras. Educ. Fís. Esp., São Paulo, v. 19, n. 3, p. 223-32, 2005.

EICHENBERGER, E. et al. SEX DIFFERENCE IN OPEN-WATER ULTRA-SWIM PERFORMANCE IN THE LONGEST FRESWATER LAKE SWIM IN EUROPE: Sex difference in ultra-swimming. J Strength Cond Res, Jun 28 2012. ISSN 1533-4287.

GERRARD, D. F. Open water swimming. Particular medical problems. Clin Sports Med, v. 18, n. 2, p. 337-47, vii, Apr 1999. ISSN 0278-5919.

KNECHTLE, B. et al. Speed during training and anthropometric measures in relation to race performance by male and female open-water ultra-endurance swimmers. Percept Mot Skills, v. 111, n. 2, p. 463-74, Oct 2010. ISSN 0031-5125.

KNECHTLE, B. et al. Prevalence of exercise-associated hyponatremia in male ultraendurance athletes. Clin J Sport Med, v. 21, n. 3, p. 226-32, May 2011. ISSN 1536-3724.

MCARDLE, W. D.; KATCH, F. I.; KATCH, V. L. Exercise Physiology: Nutrition, Energy, and Human Performance. Wolters Kluwer Health/Lippincott Williams & Wilkins, 2010. ISBN 9781608318599.

MILLET, G. P. et al. Coordination in front crawl in elite triathletes and elite swimmers. Int J Sports Med, v. 23, n. 2, p. 99-104, Feb 2002. ISSN 0172-4622.

NUCKTON, T. J. et al. Hypothermia and afterdrop following open water swimming: the Alcatraz/San Francisco Swim Study. Am J Emerg Med, v. 18, n. 6, p. 703-7, Oct 2000. ISSN 0735-6757.

RIBEIRO, L. F. P.; GALDINO, R.; BALIKIAN, P. Resposta lactacidêmica de nadadores e triatletas em função da utilização de "esteira" durante natação em velocidade correspondente ao limiar anaeróbio. Rev Paul Educ Fís, p. 55-62, 2001.

ROCHA, M. et al. Modificações na composição corporal e gasto calórico após uma maratona aquática. Revista Brasileira de Ciências do Esporte, v. 18, p. 215, 2009.

SCHMIDT, R. A.; WRISBERG, C. A. Aprendizagem e performance motora: uma abordagem da aprendizagem baseada no problema. Artmed, 2001. ISBN 8573077964.

VANHEEST, J. L.; MAHONEY, C. E.; HERR, L. Characteristics of elite open-water swimmers. J Strength Cond Res, v. 18, n. 2, p. 302-5, May 2004. ISSN 1064-8011.

WAGNER, S. et al. Higher prevalence of exercise-associated hyponatremia in female than in male open-water ultra-endurance swimmers: the 'Marathon-Swim' in Lake Zurich. Eur J Appl Physiol, v. 112, n. 3, p. 1095-106, Mar 2012. ISSN 1439-6327.

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CALORIC SPENT TWO DIFFERENT RACES OF OPEN WATER.

ABSTRACT

The open water swimming has grown very significantly in number of participants in recent years, with that, comes the need for more research on this type of solid proof and its effects on practitioners. Studies with athletes crossings are still limited in the literature, however, a variable that should be decisive for analysis of the magnitude of the requirements necessary for the successful accomplishment of these types of evidence is the estimated caloric expenditure based on this variable intensities and volumes training can be better adjusted to actual conditions of effort that athletes undergo, as well as nutritional requirements additional pre, during and post, proof can maximize the performance of the participants. The aim of the experiment was to examine the caloric expenditure of two proofs of open water distinct distances.A proof of Paulista championship open water with footage of 2.2 km and Marathon Swimming with 14 Bis 23 km away. The results indicates a high energy expenditure in the two tests, the 1st had average duration of 38 minutes and a caloric expenditure of 620 kcal, while the second had a mean duration of 8 hours and 30 minutes with a total caloric expenditure of 5346 kcal. The data demonstrate the great importance and concern mainly with feeding in the pre test and fluid and electrolyte during and post proof preserving the health of athletes and enhancing performance during the different types of evidence.

KEYWORDS: Swimming, Energy Expense, Aquatic Marathons.

DEPENSE CALORIQUE DE DEUX ELEMENTS DISTINCTS D'EAU LIBRE

RESUME

La nage en eau libre a augmenté de façon très significative du nombre de participants au cours des dernières années, avec cela, vient la nécessité de poursuivre les recherches sur ce type de preuve solide et ses effets sur les praticiens. Des études avec des passages athlètes sont encore limitées dans la littérature, cependant, une variable qui devrait être décisif pour l'analyse de l'ampleur des besoins nécessaires à l'accomplissement réussi de ce type de preuve est la dépense calorique estimée à partir de ces intensités variables et des volumes formation peuvent être mieux adaptées aux conditions réelles de l'effort que les athlètes subissent, ainsi que les besoins nutritionnels supplémentaires avant, pendant et après, la preuve peut optimiser les performances des participants. Le but de l'expérience était d'examiner la dépense calorique de deux pièces d'eau distances preuve évidente distintas.Uma de championnat Paulista eau libre avec des images de 2,2 km et marathon de natation avec 14 Bis à 23 kilomètres. Les résultats indiquent une forte dépense d'énergie dans les deux essais, le 1er ont eu une durée moyenne de 38 minutes et une dépense calorique de 620 kcal, alors que la seconde a eu une durée moyenne de 8 heures et 30 minutes avec une dépense calorique total de 5346 kcal. Les données démontrent la grande importance et concernent principalement avec l'alimentation dans le test de pré et liquides et des électrolytes durant et après la preuve préserver la santé des athlètes et amélioration de la performance au cours des différents types de preuves.

MOTS-CLÉS: Natation, Dépense Énergétique, Eau Ouverte.

EL GASTO CALÓRICO DE DOS PRUEBAS DISTINTAS DE AGUAS ABIERTAS.

RESUMEN

La natación en aguas abiertas ha crecido de forma muy significativa en el número de participantes en los últimos años, con eso, viene la necesidad de más investigación sobre este tipo de pruebas sólidas y sus efectos sobre los profesionales. Los estudios con cruces atletas son todavía limitados en la literatura, sin embargo, una variable que debe ser decisivo para el

análisis de la magnitud de los requerimientos necesarios para la realización con éxito de este tipo de pruebas es el gasto calórico estimado en base a estos intensidades variables y volúmenes formación puede ajustarse mejor a las condiciones reales de esfuerzo que los atletas se someten, así como los requisitos nutricionales pre adicional, durante y después, la prueba puede maximizar el rendimiento de los participantes. El objetivo de este experimento fue examinar el gasto calórico de dos pruebas de agua abierta distancias distintas.Uma prueba de agua Paulista campeonato abierto con imágenes de 2,2 km y el maratón de natación con 14 Bis 23 km. Los resultados indican un alto gasto de energía en las dos pruebas, la primera tuvo una duración promedio de 38 minutos y un gasto calórico de 620 kcal, mientras que el segundo tuvo una duración media de 8 horas y 30 minutos con un gasto calórico total de 5346 kcal. Los datos demuestran la gran importancia y preocupación principalmente con la alimentación en el pre-test y de líquidos y electrolitos durante y después de la prueba preservar la salud de los atletas y mejorar el rendimiento en los diferentes tipos de pruebas.

PALABRAS CLAVE: Natación, Gasto de Energía, Agua Abierta.

GASTO CALÓRICO DE DUAS PROVAS DISTINTAS DE AGUAS ABERTAS.

RESUMO

A natação de águas abertas tem crescido de forma muito significativa em número de participantes nos últimos anos, com isso, surge a necessidade de investigações mais sólidas sobre este tipo de prova e seus efeitos nos praticantes. Estudos com atletas de travessias ainda são limitados na literatura, entretanto, uma variável que deve ser decisiva para análise da magnitude das exigências necessárias para o sucesso na realização destes tipos de prova é a estimativa do gasto calórico. Com base nesta variável, intensidades e volumes de treino podem ser melhor ajustados às reais condições de esforço que os atletas se submetem, bem como, prescrições nutricionais suplementares pré, durante e pós prova que também podem maximizar o desempenho dos participantes. O objetivo do experimento foi analisar o gasto calórico em duas provas de águas abertas de distâncias distintas: uma prova do campeonato paulista de águas abertas com metragem de 2.2 km e a Maratona Aquática 14 Bis, com 23 km de distancia. Os resultados indicam um alto gasto energético nas duas provas, a 1ª teve duração media de 38 minutos e um gasto calórico de 620 Kcal, já a segunda teve a duração media de 8 horas e 30 minutos, com um gasto calórico total de 5.346 kcal. Os dados demonstram a grande importância e preocupação principalmente com a alimentação na fase pré prova, e a reposição hídrica e de eletrolíticos durante e pós prova, preservando a saúde dos atletas e potencializando o desempenho durante os diferentes tipos de prova.

PALAVRAS-CHAVES: Natação, Gasto Energético, Maratonas Aquáticas.