Palabras clave: Flexibilidad; Rango de movimiento; Condición física; Deportes

Objetivo. Valorar la flexibilidad de los principales grupos musculares de la extremidad inferior a través de pruebas de recorrido angular en jugadores de baloncesto de liga EBA.

Método. Trece jugadores de baloncesto de la Liga EBA (edad: 19,8 ± 2,6 años; peso: 89,4 ± 11,6 Kg; talla: 194,8 ± 6,9 cm) tomaron parte en este estudio. Entrenaban 4 días a la semana, 2 horas cada día y la media de años de entrenamiento fue de 9,6 ± 2,3 años. Se evaluó indirectamente la extensibilidad muscular de los principales grupos musculares de la extremidad inferior a través de 8 pruebas de rango de movimiento pasivo máximo. Un análisis descriptivo y por percentiles fue llevado a cabo para establecer los valores de referencia de normalidad (P_{21}-P_{79}). Una prueba t-Student para muestras relacionadas fue aplicada para determinar las posibles asimetrías de flexibilidad entre la extremidad dominante y no dominante.

Resultados. Los valores medios y su desviación típica fueron: 39° ± 5,1° para el gemelo, 40,1° ± 6,1° para el sóleo, 147,2° ± 6,5° para el glúteo mayor, 78,2° ± 9,1° para los isquiosurales, 43,9° ± 6,3° para los aductores, 74° ± 5,7° para los aductores monoarticulares, 14,8° ± 5,8° para el psoas-iliaco y 134,7° ± 9,1° para el cuádriceps.

Conclusión. Los valores de referencia de normalidad fueron 33°-42° para el gemelo, 35° -44° para el sóleo, 140°-153° para el glúteo mayor, 70°-85° para los isquiosurales, 36°-49° para los aductores, 67°-78° para los aductores monoarticulares, 9°-20° para el psoas-iliaco y 125°-139° para el cuádriceps. No fueron encontradas asimetrías bilaterales de flexibilidad.

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Metabolic effects of aerobic interval exercise combined with resistance training in obese rats

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Keywords: Lipid profile; Insulin sensitivity; Metabolic syndrome; Phenotype; Cholesterol

Objective. To investigate the effects of aerobic interval exercise combined with resistance training (AIEaRT) on body composition, lipid and glycaemic profile in obese rats.

Methods. Thirty-two Zucker rats were divided into a genetically obese phenotype (Fa/fa, n = 16) vs lean phenotype (Fa/+, n = 16). Each phenotype was further divided into exercise or sedentary (n = 8). Exercise group followed a training protocol consisting in AIEaRT 60 min/day, 5 days/week for 8 weeks. Body weight, muscle and fat mass, plasma total cholesterol, LDL-cholesterol, HDL-cholesterol, phospholipids and triglycerides were measured. Blood fasting and postprandial glucose at 30, 60, 90 and 120 min were also estimated.

Results. Body fat was lower in the AIEaRT compared to the sedentary groups for both phenotypes ($p < 0.001$). Plasma triglycerides were lower in the AIEaRT compared to the sedentary obese group ($p < 0.001$). Plasma LDL-cholesterol and fasting glucose were lower in the AIEaRT compared to the sedentary groups for both phenotypes ($p < 0.001$). Postprandial glucose at 15, 30 and 60 min was lower in the AIEaRT compared to the sedentary groups for both phenotypes ($p < 0.001$) and at 90 and 120 min in the obese group ($p < 0.001$).

Conclusions. Sedentary Fa/fa rats obtained the worst values for lipids and glycaemia but AIEaRT interacted on reducing this adverse metabolic status. Moreover, fasting and postprandial glucose concentrations were similar in obese-trained than in sedentary-lean rats.

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A Mediterranean diet is not enough for cardio-metabolic health: Physical activity and physical fitness are major contributors in European adolescent

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Key words: Mediterranean diet score; Moderate-to-vigorous physical activity; Body composition; lipid profile; Blood pressure; Insulin resistance; HELENA Study

Aims. To examine the impact of adherence to the Mediterranean diet on body fatness and cardio-metabolic profile and the concomitant role of physical activity (PA) and cardiorespiratory fitness (CRF) in European adolescents (n = 2340; 12.5-17.5years) participating in the HELENA-study.

Method. A Mediterranean Diet Score (MDS) was calculated after assessing dietary intake by two non-consecutive24 h dietary recalls. PA was measured by accelerometry and CRF with the 20m shuttle run test. Cardio-metabolic risk (CMR) factor measurements included anthropometric parameters, blood lipid profile, blood pressure and insulin resistance. A CMR index and a fatness index were computed.

Results. MDS was inversely related to systolic blood pressure and PA with most CMR factors, after adjusted for energy intake and PA and for energy intake and MDS, respectively. However, associations between PA and fatness markers disappeared after adjusting for CRF. Overall, CRF was inversely related to all CMR factors also in the fully adjusted models which included MDS, energy intake and PA. Individuals with high MDS and being more physically active had the lowest score on fatness and the healthiest profile on most CMR factors (except systolic blood pressure and total cholesterol) regardless of sex, age, socioeconomic-status, parental education

and centre. These associations were attenuated after adjustment for energy intake and disappeared when CRF was considered. Adolescents with high CRF had lower fatness, a healthier profile in most CMR factors and cardio-metabolic scores independently of their MDS (all P≤0.044). Results persisted after further adjusting for energy intake and PA (except for systolic blood pressure, total cholesterol and triglycerides).

Conclusion. Adherence to the Mediterranean diet alone is an insufficient fundament for lower adiposity and better cardiometabolic health in adolescents. A combination of a Mediterranean diet with an active lifestyle and high cardiorespiratory fitness seems to be most effective with an active.

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MCT1 T1470A polymorphism influences adherence to strength training in overweight and obese men following a weight loss program

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Keywords: Training adherence; MCT1; Overweight; Obesity; Weight loss program

Introduction. The monocarboxylate transporter (MCT) family member MCT1 transports lactate into and out of myocytes. Oxidative cells import lactate through MCT1 as a substrate, being the role of MCT1 in glycolysis-derived lactate efflux less clear. MCT1 T1470A polymorphism (rs1049434), which has been related with lactate metabolism and sports specialty [1, 2], could be an influencing factor for exercise adherence. Therefore the aim of this study was to relate the adherence to different training modalities with the T1470A MCT1 polymorphism in overweight and obese men following a weight loss program (WLP).

Methods. Seventy overweight and obese (body mass index 25-34.9 kg/m^2) males, aged 18-50 years, followed a WLP of 24 weeks, combining exercise and diet. Subjects were randomized into three training groups: strength, S; endurance, E; or concurrent strength and endurance, SE; with a training frequency of 3 times/week, and an intensity progressing from 50 to 60% of 15 repetition maximum or heart rate reserve [3]. One-way ANCOVA adjusting by adherence to diet was used to compare adherence to training among genotypes (TT, TA or AA).

Results. The ANCOVA test showed differences among genotypes (p = 0.01) within the S group, having the TT participants less adherence (Mean ± Standard Error) (79.9 ± 2.9%) than the TA (91.5 ± 1.7%; p = 0.01) and the AA (92.7 ± 2.9%; p = 0.02). No significant differences were found for this variable among genotypes in the E (TT = 92.9 ± 3.3%; TA = 90.8 ± 2.3%; AA = 87.9 ± 3.6%) or the SE (TT = 87.5 ± 3.1%; TA = 87.8 ± 3.5%; AA = 84.8 ± 3.3%) exercise groups.

Conclusion. Our results suggest that the MCT1 T1470A polymorphism could influence adherence to strength exercise in men, being those with a minor lactate efflux from the myocytes (TT) [1] less adherent to the program. Although the TT genotype has been related with sprint/power sports, the lactate availability could determine the acceptance of a resistance exercise routine within a WLP in sedentary overweight/obese men.

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Influencia de tres tipos diferentes de entrenamiento (Electroestimulación global, High Intensity Interval Training (HIIT) y Aerobio convencional) sobre el metabolismo basal post esfuerzo

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Palabras clave: Metabolismo basal post esfuerzo; Composición corporal; Electroestimulación; High Intensity Interval Training; Entrenamiento Aerobio

Objetivo. El desarrollo de este estudio tiene como principales objetivos: a) determinar el tiempo de activación metabólica tras un esfuerzo de alta intensidad o aerobio moderado, y b) cuantificar el gasto energético extra derivado de la activación muscular mediante diferentes tipos e intensidades de entrenamiento: Electroestimulación, HIIT y Aerobio. Como objetivo secundario se pretende establecer la modificación de la composición corporal en función de los diferentes tipos de entrenamiento, así como la producción de lactato al finalizar cada uno de los mismos.

Método. Sujetos sedentarios, con índice de masa corporal ≥ de 35, se someterán a tres tipos de entrenamiento en tres lunes consecutivos, de forma aleatoria y randomizada. Previamente se ha determinado en todos ellos el metabolismo basal mediante análisis de gases durante 20 minutos, en ayunas, a primera hora de la mañana, tras 10 minutos de estabilización. A los 60 minutos del entrenamiento, a las 24, a las 48 y a las 72 horas, se volvió a realizar la metabolimetría basal y DXA. Todas las sesiones han sido monitorizadas mediante un pulsómetro. Al inicio y al final de cada semana se llevó a cabo un análisis de composición corporal mediante DXA (Absorciometría Dual de RX) y al finalizar cada entrenamiento se realizó una medición de lactato.

Resultados. Los resultados han mostrado unos mayores niveles de concentración de lactato en sangre al finalizar el entrenamiento de alta intensidad (15,6 mmol.L-1) que los producidos al realizar un trabajo de tipo aerobio (2 mmol.L-1). Por otro lado, se encontraron diferencias significativas en el consumo de oxígeno basal post-esfuerzo en situación previa, a los 60, a las 24 h, 48 h y 72 h tras los diferentes tipos de entrenamiento. Los niveles de déficit de oxígeno basal alcanzados en el entrenamiento de electroestimulación y HIIT se elevaron notablemente por encima de los alcanzados en el pre-test hasta 72 h después de haber realizado el entrenamiento, dándose diferencias significativas con el trabajo de tipo aerobio, tras el cual, los niveles de VO2 alcanzaron valores similares a los obtenidos en el pre-test.

Conclusión. El entrenamiento de alta intensidad (Electroestimulación y HIIT) genera un consumo calórico más elevado, incrementando la tasa metabólica durante varios días tras el esfuerzo, mientras que el trabajo aerobio convencional supone un gasto menor, y tan solo durante el ejercicio, pero no a posteriori.

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