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JOINT EVENT ON
13th Euro Obesity and Endocrinology Congress
and
16th World Congress on Nutrition and Food Chemistry
September 18-20, 2017 | Zurich, Switzerland

J Nutr Food Sci 2017, 7:5(Suppl)
DOI: 10.4172/2155-9600-C1-048

Does physical activity influence the metabolically healthy obese phenotype in adults?

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Introduction: Metabolically healthy obese (MHO) are a subset of the obese population that do not exhibit metabolic health problems or have developed any diseases associated with obesity. It is largely debated on what determines the MHO phenotype, whether it is genetic or due to lifestyle. Our aim was to examine the difference in physical activity between MHO and their metabolically unhealthy counterparts (MUO) by objectively measuring physical activity using physical activity monitors and investigating the influence of cardiorespiratory fitness (CRF).

Methods: A total of 9 MHO adults (means ± S.D.; 47 ± 9 years, 32 ± 1 kg/m^2) and 12 MUO adults (46 ± 11 years, 34 ± 3 kg/m^2) were recruited. CRF was assessed by a peak oxygen consumption test. Differences between groups were analysed using Independent-Samples t tests. A binary backward logistic regression (WALD) analysis was performed to find the biggest predictor of the metabolically healthy obese phenotype.

Results: MHO group spent more time sedentary [980.5mins/day (95% CI, 895.4, 1065.6)] than did MUO group [1111.5mins/day (95% CI, 1019.9, 1203.2); P=0.032]. Daily time spent carrying out vigorous activity was significantly higher in MHO group [13.5mins/day (95% CI, 6.9, 20.1)] than in MUO group [4.4mins/day (95% CI, 2.3, 13.4); P=0.030]. Cardiorespiratory fitness (VO_2 peak) was higher in MHO group [31.5ml kg−1 min−1 (95% CI, 26, 37)] than the MUO group [24.2ml kg−1 min−1 (95% CI, 21.2, 27.3); P= 0.011]. A strong correlation was found between sedentary time and CRF (r= -0.804, P=0.005).

Conclusion: Our results suggest that MUO individuals are more sedentary, carry out less vigorous activity and have a lower CRF. CRF could be utilised as a prognostic tool to assess the risk of being metabolically unhealthy obese, reducing the risk of cardiovascular disease. Government guidelines should be amended to incorporate methods to reduce sedentary time.

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