

CARDIOVASCULAR FITNESS AND HOMOCYSTEINE LEVELS IN SPANISH ADOLESCENTS

R. Solá^{ab}, J.R. Ruiz^{ac}, M. González-Gross^{ad}, F.B. Ortega^{ac}, G. Vicente-Rodríguez^e, M. García-Fuentes^f, A. Gutiérrez^a, M. Sjöström^c, K. Pietrzik^g y M.J. Castillo^a

^aDepartamento de Fisiología, Facultad de Medicina, Universidad de Granada, Granada, Spain. ^bUnidad de Hematología, Hospital Clínico Universitario San Cecilio. ^cUnit for Preventive Nutrition, Department of Biosciences and Nutrition at NOVUM, Karolinska Institutet, Huddinge, Sweden. ^dFacultad de Ciencias de la Actividad Física y del Deporte, Universidad Politécnica de Madrid. Spain. ^eE.U. Ciencias de la Salud, Universidad de Zaragoza, Zaragoza, España. ^fDepartamento de Pediatría. Universidad de Cantabria, Santander, España. ^gInstitut fuer Ernährungswissenschaft. Abt. Pathophysiologie der Ernährung. Rheinische Friedrich-Wilhelms Universität. D-53115 Bonn. Alemania.

Aim: To examine the associations of total plasma homocysteine (tHcy) with cardiovascular fitness (CVF) in Spanish adolescents.

Methods: A total of 156 adolescents (76 males, and 80 females), aged 14.8 ± 1.4 years old were studied. Cardiovascular fitness was measured by the 20 m shuttle run test. Genotyping for the methylenetetrahydrofolate reductase (MTHFR) 677C>T polymorphism was done by DNA sequencing. Fasting tHcy level was the outcome variable. Multiple regressions were used to determine the degree to which variance in tHcy was explained by CVF after control for age, puberty, birth weight, smoking, socioeconomic status, and sum of six skinfolds, serum folate, serum vitamin B₁₂, and MTHFR 677C>T genotype.

Results: Cardiovascular fitness was significantly associated with tHcy levels in female adolescents after controlling for potential confounders including MTHFR 677C>T. Mean values of tHcy were significantly higher in the MTHFR 677CT and TT subgroups compared to CC subgroup in males, while in females, mean values of tHcy were significantly higher in the TT subgroup compared to CC and CT subgroup.

Conclusions: The results of this study suggest that CVF is associated with tHcy levels in female adolescents, even after control for MTHFR 677C>T genotype, which show a main effect on the tHcy levels at these ages in both males and females.

Acknowledgements: This study has been supported by: the Spanish Ministry of Health Instituto de Salud Carlos III (FIS PI021830); the Spanish Ministry of Health, FEDER-FSE funds FIS nº 00/0015, CSD grants 05/UPB32/0, 109/UPB31/03 and 13/UPB20/04; the Spanish Ministry of Education (AP2003-2128; AP-2004-2745); and scholarships from Panrico S.A., Madaus S.A. and Procter and Gamble S.A.