

perforation and the potential seriousness of the process could be underestimated. In addition, because contrast studies are not needed to obtain the information required, the lower radiation dose received by the patient is compensated by the potential benefits of its diagnostic capacity.

Miguel A. Arias,^{a,*} Jesús Jiménez-López,^a Alberto Puchol,^a and Alfonso Cañas^b

^aUnidad de Arritmias y Electrofisiología Cardíaca, Servicio de Cardiología, Hospital Virgen de la Salud, Toledo, Spain

^bServicio de Cirugía Cardíaca, Hospital Virgen de la Salud, Toledo, Spain

*Corresponding author:

E-mail address: maapalomares@secardiologia.es (M.A. Arias).

Available online 9 March 2011

REFERENCE

1. Ellis CR, Rottman JN. Increased rate of subacute lead complications with small-caliber implantable cardioverter-defibrillator leads. *Heart Rhythm*. 2009;6: 619–24.

doi:10.1016/j.rec.2010.10.023

Trends in Six Years Participation in Extracurricular Physical Activity in Adolescents. The AVENA and AFINOS Studies^{*}

Tendencias de participación durante seis años en actividad física extraescolar en adolescentes. Estudios AVENA y AFINOS

To the Editor,

Meseguer et al. recent study¹ presented trends in adult leisure time and workplace physical activity in the *Región de Madrid* autonomous community of Spain between 1995 and 2008. Their results highlight a slight fall in levels of leisure time physical activity and an especially interesting increase in the proportion of men and women who engage in no leisure time physical activity at all. Currently, no data exist on trends in Spanish adolescents' engagement in leisure time or extracurricular physical activity. These data could be of interest to public health authorities given that adolescence is a stage of life characterized by a substantial decline in levels of physical activity, compared with infancy.² Moreover, an active lifestyle during adolescence could prevent cardiovascular and metabolic disease from developing at this age^{3,4} and in adulthood.⁵

We set out to investigate trends in adolescents' participation in extracurricular physical activity in the city of Madrid (Spain) between 2001–2002 and 2007–2008. To achieve this, we used data on participation in extracurricular physical activity adolescents 13 to 17 years of age in Madrid, obtained in the AVENA (Food and Assessment of the Nutritional Status of Spanish Adolescents)⁶ and AFINOS (Physical Activity as a Preventive Measure for Overweight, Obesity, Infection, Allergies and Cardiovascular Risk Factors in Adolescents)⁷ studies. For the present study, we included data obtained on 573 adolescents (50.1% girls) in the AVENA study and 956 adolescents (48.5% girls) in the AFINOS study. Analysis of the sample reflects a slight increase in the proportion of adolescents engaging in extracurricular physical activity (60.9% vs 64.2%, in 2001–2002 and 2007–2008, respectively), although differences were non-significant ($P = .193$). Analysis of data by sex found nonsignificant increases in the percentages of both boys (74.9% vs 76.9%; $P = .455$) and girls (46.4% vs 51.6%; $P = .171$) engaging in extracurricular physical activity. However, differences remained in the proportions of boys and girls who participated ($P < .001$).

From data on weight and height (measured objectively in AVENA and self-reported in AFINOS), we calculated body mass

index and classified the adolescents as normal or overweight (including obesity).⁸ We also classified them in 3 groups (poor, average, good) by self-reported physical condition level recorded on a 5-point Likert scale (very poor, poor, average, good, very good) used in both studies. We found no significant differences in the percentage of adolescents participating in extracurricular physical activity between 2001–2002 and 2007–2008 by body weight or physical condition ($P > .05$). These results indicate the trend of adolescents participating in extracurricular physical activity in Madrid remained steady over these 6 years. Although the lack of a fall in the percentage of adolescents engaging in physical activity could initially be considered positive, a) differences between genders were maintained and girls participated less than boys, and b) educational and public health policy applied in Madrid in recent years aiming to increase adolescent participation in extracurricular physical activity has apparently not had the desired impact. Hence, we urgently need to design more effective policies aimed at increasing adolescent participation in extracurricular physical activity, principally directed at the adolescents themselves.

David Martínez-Gómez,^{a,*} Miguel Martín-Matillas,^b Oscar L. Veiga,^c and Ascensión Marcos^a

^aGrupo Inmunonutrición, Departamento de Metabolismo y Nutrición, Instituto de Ciencia y Tecnología de Alimentos y Nutrición (ICTAN), Consejo Superior de Investigaciones Científicas (CSIC), Madrid, Spain

^bDepartamento de Educación Física y Deportiva, Facultad de Ciencias de la Actividad Física y el Deporte, Universidad de Granada, Granada, Spain

^cDepartamento de Educación Física, Deporte y Motricidad Humana, Facultad de Formación del Profesorado y Educación, Universidad Autónoma de Madrid, Madrid, Spain

*Corresponding author:

E-mail address: d.martinez@uam.es (D. Martínez-Gómez).

Available online 31 March 2011

REFERENCES

1. Meseguer CM, Galán I, Herruzo R, Rodríguez-Artalejo F. Tendencias de actividad física en tiempo libre y en el trabajo en la Comunidad de Madrid, 1995–2008. *Rev Esp Cardiol*. 2011;64:21–7.
2. Nader PR, Bradley RH, Houts RM, McRitchie SL, O'Brien M. Moderate-to-vigorous physical activity from ages 9 to 15 years. *JAMA*. 2008;300:295–305.
3. Strong WB, Malina RM, Blimkie CJ, Daniels SR, Dishman RK, Gutin B, et al. Evidence based physical activity for school-age youth. *J Pediatr*. 2005;146: 732–7.
4. Janssen I. Physical activity guidelines for children and youth. *Can J Public Health*. 2007;98:S109–21.

^{*} The names of the AFINOS and AVENA study researchers can be found in annexes to the articles published in *Rev Esp Cardiol*. 2010;63:277–85 and *Rev Esp Cardiol*. 2007;60:581–8, respectively.

5. Malina RM. Physical activity and fitness: pathways from childhood to adulthood. *Am J Hum Biol.* 2001;13:162-72.
6. González-Gross M, Castillo MJ, Moreno L, Nova E, González-Lamuño D, Pérez-Llamas F, et al. Alimentación y Valoración del Estado Nutricional de los Adolescentes Españoles (Proyecto AVENA). Evaluación de riesgos y propuesta de intervención. I. Descripción metodológica del estudio. *Nutr Hosp.* 2003;18:15-27.
7. Veiga OL, Gómez-Martínez S, Martínez-Gómez D, Villagra A, Calle ME, Marcos A. Physical activity as a preventive measure against overweight, obesity, infections,

allergies and cardiovascular disease risk factors in adolescents: AFINOS Study protocol. *BMC Public Health.* 2009;9:475.

8. Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. Establishing a standard definition for child overweight and obesity worldwide: international survey. *BMJ.* 2000;320:1240-3.

doi:10.1016/j.rec.2011.01.007

NSTEMI During a Stress Echocardiogram With Dobutamine: Where Is the Problem?

IAMSEST durante la realización de un ecocardiograma de estrés con dobutamina: ¿dónde está el problema?

To the Editor,

Few studies have assessed the safety of dobutamine stress echocardiograms (DSE) since they were introduced into clinical practice in 1979. Rodríguez García et al.¹ describe a major complication rate of 1/325 with a dose >20 µg/kg/min, which is comparable to the results from a recently published meta-analysis by Geleijnse et al. (1/475).² Acute myocardial infarction (AMI) is a rare complication (0.02%-0.06%) in patients with coronary disease. Although these cited papers do not specify which definition of AMI was used, the first was published in 2001¹ and the second² includes studies performed in the nineties. The current AMI definition was published in 2007,³ and establishes the "central role" of troponin. Meanwhile, dobutamine at doses >20 µg/kg/min is a strong inducer of ischemia due to its effects on arterial tone and double product, and some authors attribute to it increases in the activation and aggregation of platelets.^{1,2} For the following case treated at our institution, we highlight the difficulties associated with interpreting isolated increases of troponin in the context of DSE under the current AMI definition.

The patient is a 60-year-old female presenting with obesity, hypertension, and type II diabetes. After 2 months of outpatient care for symptoms of effort angina, she was referred by the emergency room due to prolonged chest pain while at rest, unexplained by electrocardiographic or laboratory testing. Anti-ischemic treatment was prescribed and conventional ergometry and echocardiogram tests were ordered. The echocardiogram indicated dubious segment alterations on the anterior face. Conventional Bruce ergometry tests without medication, in which the patient reached 86% of the theoretical maximum heart rate, 10.2 MET, came back clinically and electrically negative, with an adequate blood pressure response. Given the persistence of symptoms during hospitalization and the echocardiographic anomalies, we decided to use a DSE. Under the conventional protocol, 10-40 µg/kg/min of dobutamine and 1 mg of atropine achieved 90% of theoretical maximum heart rate. After administering the atropine, the patient developed chest pain associated with vegetative reactions that persisted for 3 h, with no registry in the electrocardiogram or echocardiogram. We documented increased troponin I levels (maximum: 0.67 ng/ml at 3 h; normal until 0.04 ng/ml, and range of AMI ≥0.4) with normal creatine kinase. No epicardial lesions were found with the coronariography. Symptoms were attributed to a microcirculatory disease. No coronary vasospasm tests were administered, and the patient was treated with nitrates and diltiazem.

According to the current criteria defining acute coronary syndrome,³ our patient had a non-ST-segment myocardial infarction with no epicardial coronary lesions. The symptoms indicate

microvascular damage. We did not rule out a possible vasospastic origin, but this was unlikely given that the absence of ST-segment alterations and motility in the acute phase. Furthermore, some studies have concluded that this possibility would be masked if the spasm were "distal".²

Some authors have measured troponin after DSE with contradictory results in terms of diagnostic and prognostic usefulness. Pastor et al.⁴ found significant lesions in all patients that had an available coronariography, negative DSE, and elevated troponin levels. In addition, they concluded that dobutamine at the levels administered in these tests can produce slight myocardial damage as shown by the elevation in troponin levels, without abnormal motility and angiographic lesions. However, Meluzin et al.⁵ and Beckman et al.⁶ did not observe increased troponin I or T levels in 27 and 20 patients, respectively, with altered contractility during DSE and a known coronary disease.

The current definition of AMI may be too strict to be applied to spasm provocation tests such as DSE, and the problem could be increased with new "ultra-sensitive" techniques for detecting troponin levels. Furthermore, the incidence of AMI in the medical literature appears to be lower than the real values, probably due to the use of criteria that differ from our current definition. We need studies that evaluate the prognostic value of the increases in troponin levels after stress tests, which would allow their safety to be better assessed.

Juan G. Córdoba-Soriano,* Juan Carlos García López, Víctor M. Hidalgo-Olivares, and Ana M. Ruíz Tornero

Servicio de Cardiología, Complejo Hospitalario Universitario de Albacete, Albacete, Spain

*Corresponding author:

E-mail address: jgcordobas@hotmail.com (J.G. Córdoba-Soriano).

Available online 5 April 2011

REFERENCES

1. Rodríguez García MA, Iglesias-Garriz I, Corral Fernández F, Garrote Coloma C, Alonso-Orcajo N, Branco L, et al. Evaluación de la seguridad de la ecocardiografía de estrés en España y Portugal. *Rev Esp Cardiol.* 2001;54:941-8.
2. Geleijnse ML, Krenning BJ, Nemes A, Van Dalen BM, Soliman O, Ten Cate FJ, et al. Incidence, pathophysiology, and treatment of complications during dobutamine-atropine stress echocardiography. *Circulation.* 2010;121:1756-67.
3. Thygesen K, Alpert JS, White HD, on behalf of the Joint ESC/ACCF/AHA/WHF Task Force for the Redefinition of Myocardial Infarction. Universal definition of myocardial infarction. *Eur Heart J.* 2007;28:2525-38.
4. Pastor G, San Román JA, González-Sagrado M, Vega JL, Arranz ML, Serrador AM, et al. Ecocardiografía de estrés con dobutamina y troponina T como marcador de daño miocárdico. *Rev Esp Cardiol.* 2002;55:469-73.
5. Meluzin J, Toman J, Groch L, Hornacek I, Sitar J, Fischerova B, et al. Can dobutamine echocardiography induce myocardial damage in patients with dysfunctional but viable myocardium supplied by a severely stenotic coronary artery? *Int J Cardiol.* 1997;61:175-81.
6. Beckman S, Boschs W, Müller C, Schartl M. Does dobutamine stress echocardiography induce damage during viability diagnosis of patients with chronic dysfunction after myocardial infarction? *J Am Soc Echocardiogr.* 1998;11:181-7.

doi:10.1016/j.rec.2010.10.036