

- González Hernández G. La relación entre los problemas ambientales y algunas enfermedades. *Medicent Electrón* [Internet]. 2005 [citado 2013 Jun 3]; 9(3): [aprox. 3 p.]. Disponible en: <http://medicentro.vcl.sld.cu/paginas%20de%20acceso/Sumario/ano%202005/v9n3a05/problema42.htm>
- CITMA. Informe de Cuba a la Conferencia de las Naciones Unidas sobre Desarrollo Sostenible Río + 20. [Internet]. La Habana; 2012 [citado 2013 May 28]. Disponible en: <http://www.cubadebate.cu/wp-content/uploads/2012/06/informe-cuba-a-rio20.pdf>
- Rich DQ, Kipen HM, Huang W, Wang G, Wang Y, Zhu P, *et al.* Association between changes in air pollution levels during the Beijing Olympics and biomarkers of inflammation and thrombosis in healthy young adults. *JAMA*. 2012;307(19):2068-78.
- Bell ML, Peng RD, Dominici F, Samet JM. Emergency hospital admissions for cardiovascular diseases and ambient levels of carbon monoxide: results for 126 United States urban counties, 1999-2005. *Circulation*. 2009;120(11):949-55.
- Durante W, Johnson FK, Johnson RA. Role of carbon monoxide in cardiovascular function. *J Cell Mol Med*. 2006;10(3):672-86.
- Chow CK, Lock K, Teo K, Subramanian SV, McKee M, Yusuf S. Environmental and societal influences acting on cardiovascular risk factors and disease at a population level: a review. *Int J Epidemiol*. 2009; 38(6):1580-94.
- Li L, Hsu A, Moore PK. Actions and interactions of nitric oxide, carbon monoxide and hydrogen sulphide in the cardiovascular system and in inflammation – a tale of three gases! *Pharmacol Ther*. 2009;123(3):386-400.
- Babisch W, Pershagen G, Selander J, Houthuijs D, Breugelmans O, Cadum E, *et al.* Noise annoyance – a modifier of the association between noise level and cardiovascular health? *Sci Total Environ*. 2013;452-453:50-7.
- Argalášová-Sobotová L, Lekaviciute J, Jeram S, Sevciková L, Jurkovicová J. Environmental noise and cardiovascular disease in adults: research in Central, Eastern and South-Eastern Europe and Newly Independent States. *Noise Health*. 2013;15(62):22-31.
- Davies H, Kamp IV. Noise and cardiovascular disease: a review of the literature 2008-2011. *Noise Health*. 2012;14(61):287-91

Erectile dysfunction: predictor of cardiovascular disease

Disfunción eréctil: factor predictor de enfermedad cardiovascular

Yudileidy Brito Ferrer, MD; Ana I. Árias Gallardo, MD, MSc[✉]; and Yossy González Caballero, BS

Dr. Serafín Ruiz de Zárate Ruiz University of Medical Sciences. Santa Clara, Villa Clara, Cuba.

Received : May 09, 2013

Accepted : July 04, 2013

Key words: Erectile dysfunction, Cardiovascular disease, Endothelial dysfunction
Palabras clave: Disfunción eréctil, Enfermedad cardiovascular, Disfunción endotelial

To the Editor:

Erectile dysfunction (ED) is an extremely common disease, which increases its incidence with age and affects moderately/severely about 35 % of men between 40 and 70 years of age. ED has multiple causes, and those of vascular origin are the most fre-

quent ones. This major cause of ED accounts for up to 70 % of this sexual disorder in men over 40, and is associated with other cardiovascular (CV) risk factors such as dyslipidemia, hypertension, diabetes mellitus, obesity, among others^{1,2}.

Also, ischemic heart disease, or more generally, CV

disease shows a clear increase in prevalence with age. Therefore, it is natural that both are associated. But this association is stronger than would be expected by a simple association with age. Indeed, ED and CV disease share common risk factors and mechanisms. It is becoming increasingly accepted that ED is caused, in most cases, by endothelial dysfunction, and it is known that this is an early alteration in atherosclerotic disease¹⁻³.

The association between ED and coronary artery disease (CAD) has been known for some years, and even ED is considered a predictor of CAD. When adjusting the risk for age, smoking and obesity, patients with ED have twice the danger of having an acute myocardial infarction than control patients, and it is the most powerful predictor of CAD (OR = 14.8), so it occurs early (average 39 months before) in 70% of patients with symptoms of CAD¹.

According Marconi *et al.*², Pritzker *et al.* found 28 patients with positive stress test for ischemia in a series of 50 men (age range 40-60 years) with ED and no other CV symptoms, of which 20 had positive coronary angiography. This author concluded that erection could be considered as a stress test of the cavernous arteries and that ED, as such, was an early predictor of endothelial dysfunction and CAD.

In a prospective study, Montorsi *et al.*⁴ evaluated a series of 300 men with symptomatic CAD, which was documented by coronary angiography, and 49% of them had some degree of ED at the time of the interview. However, the most important aspect was that in 67 % of these men ED had preceded the onset of coronary symptoms with an average time of 39 months, between the beginning of ED and the coronary event. This study reinforced the idea that in asymptomatic men, from the CV point of view, the first manifestation of arterial dysfunction may be the ED, and this should be an early warning to purposely assess the coronary arteries^{4,5}.

All these epidemiological evidences show that ED is a primary manifestation of endothelial dysfunction, and that, in a significant percentage of men suffering from it, it has a time span which enables its classification as a predictor of CAD.

Because penile arteries have a smaller diameter than coronary arteries, erectile sexual dysfunction appears first as clinical manifestation of endothelial damage, and several months later coronary dysfunction appears. This explains why the penis is considered

as a barometer endothelial health³.

The ED generally appears about two or three years before the manifestation of ischemic heart disease and, therefore, its detection could allow therapeutic measures that could prevent more serious CV complications⁶. Conversely, more than two-thirds of men with CAD have, when questioned, a history of ED^{3,7}.

Endothelial dysfunction contributes to the atherosclerotic process, may also be involved in the pathogenesis of ED and promotes the development of coronary syndromes (stable, unstable and Prinzmetal's angina). Besides, CV risk factors are prevalent in patients with ED and correlate with endothelial dysfunction, hypertension, hypercholesterolemia, diabetes mellitus, smoking and age⁸.

The vascular endothelium is of extraordinary importance in biological processes such as penile erection, inflammation, platelet aggregation, vascular smooth muscle proliferation, and modulation of vascular tone and flow⁶⁻⁸.

This is an issue recently reported in Cuba; the first publication in this regard was Dr. Rivas Estany's editorial in the *Revista Cubana de Cardiología y Cirugía Cardiovascular*⁹, which refers to the Consensus Meeting on Cardiovascular Disease and Sexuality held in Havana. It is a new line of research that deserves our attention, as it is likely to have a major impact on the early diagnosis and prevention of coronary artery disease.

REFERENCES

1. Martínez-Jabaloyas JM. Prevalencia de comorbilidades en pacientes con disfunción eréctil. *Actas Urol Esp.* 2013;37(1):33-9.
2. Marconi M, Petricevic E, Avillo V, Valdevenito R, Dusillant G. Disfunción eréctil y estudio vascular de arterias cavernosas como factor predictor de cardiopatía coronaria. *Rev Hosp Clín Univ Chile.* 2009;20(2):160-6.
3. Romero CE. Disfunción eréctil y enfermedad cardiovascular. *Rev Urug Cardiol.* 2008;23(1):65-70.
4. Montorsi P, Ravagnani PM, Galli S, Salonia A, Briganti A, Werba JP, *et al.* Association between erectile dysfunction and coronary artery disease: Matching the right target with the right test in the right patient. *Eur Urol.* 2006;50(4):721-31.
5. Matheus WE, Fregonesi A, Ferreira U. Disfunção eréctil. *RBM, Rev Bras Med.* 2009;66(12):85-9.
6. Javaroni V, Neves MF. Erectile dysfunction and

- hypertension: impact on cardiovascular risk and treatment. *Int J Hypertens*. [Internet]. 2012 [citado 2013 Abr 10]; [aprox. 11 p.]. 2012;2012: 627278. Disponible en:
<http://dx.doi.org/10.1155/2012/627278>
7. Wu HT, Lee CH, Chen CJ, Tsai IT, Sun CK. A simplified approach to assessing penile endothelial function in young individuals at risk of erectile dysfunction. *J Androl*. 2012;33(6):1254-62.
 8. Schwartz BG, Economides C, Mayeda GS, Burstein S, Kloner RA. The endothelial cell in health and disease: its function, dysfunction, measurement and therapy. *Int J Impot Res*. 2010;22(2):77-90.
 9. Rivas Estany E. Disfunción sexual eréctil: un marcador de enfermedad coronaria. *Rev Cubana Cardiol Cir Cardiovasc* [Internet]. 2013 [citado 2013 Abr 15]; 19(1):1-2. Disponible en:
<http://www.revcardiologia.sld.cu/index.php/revcardiologia/article/view/352/322>.