

Sexual Dysfunction in Cardiac Rehabilitation Patients Is Much More Than Simply an Epiphenomenon and Needs More Study

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It appears interesting that 2 of the world's most intellectual and scientifically productive minds commented often about the relevance of sexual function and its potential problems. Johann Wolfgang Von Goethe (1749-1832) was not only a writer and scientist who independently discovered the human intermaxillary bone in 1784 and the first who formulated a theory of plant metamorphosis, but many of Goethe's artistic works such as *Faust* or the *Venetian Epigrams* do contain a relatively heavy sexual content, since he saw sexuality in general as a topic that merited poetic and artistic depiction. A few hundred years earlier than that, Leonardo da Vinci (1452-1519), the epitome of the Italian Renaissance stated: "The penis does not obey the order of its master, who tries to erect or shrink it at will, whereas instead the penis erects freely while its master is asleep. The penis must be said to have its own mind, by any stretch of the imagination." Since then, researchers have determined the penis isn't quite as independently minded as da Vinci observed hundreds of years ago, but is largely under the control of the central nervous system and its function as a sexual organ is highly dependent on vascular properties. In spite of the appreciation of sexuality as essential in human life and the attempts to understand the pathophysiology of dysfunction by these and several other extraordinary minds, the acceptance of sexual problems, in men as well as in women up to this day and therefore, the intuitive search for scientific answers continues to be blurred by an overwhelming lack of comprehension.

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Maroto-Montero's paper¹ in this issue of *Revista Española de Cardiología* helps to re-emphasize the relative high prevalence and importance of sexual problems, especially as shown here in a group of patients undergoing cardiac rehabilitation. Fact is that sexual dysfunction affects a large number of people and it is more than just epiphenomenon of increased age or underlying cardiovascular disease that requires more attention and evaluation. In particular rehabilitation—in its purest sense—is considered a controlled way to restore or recover prior functionality. Even though relatively unknown in the US several years ago, while widely (over-) used in some Western European countries, rehabilitation is a means to help with more than just a single organ problem (such as the heart). Rehabilitation currently is more frequently in the news, especially in the yellow press in Hollywood since it appears to be fashionable among nouveau-riche starlets who, unfortunately, often end up as drug or alcohol abusers. Rehabilitation is thought to enable the patients to cease any (substance) abuse in order to avoid the psychological, legal, financial, social, and physical consequences that can be caused by the abuse. In contrast, in cardiac rehabilitation men and women are guided after myocardial infarction or coronary artery bypass surgery to regain full organ and social function, mostly with help of physiotherapy, occupational therapy, psychotherapy, and pharmacotherapy. Interestingly, often physical and organic functions often recover almost completely, while sexual dysfunction seems to become chronic. In the above mentioned paper in this issue of the journal,¹ almost 53% of men suffered from erectile dysfunction that was associated with increased age, concomitant diabetes mellitus, hypertension, cigarette smoking, and the use of ACE-inhibitors and diuretics. The authors see this number as huge for this population, however, it might be argued that this seems to be severely underestimated, mainly secondary to 2 factors: a) underreporting by patients and b) potential methodological errors in the current study.

In comparison with the Massachusetts Male Aging study,² the reported prevalence of erectile dysfunction

(ED) among men appears to be very small since the prevalence of ED men above the age of 50 has been reported as high or even higher than the numbers given here in a group of patients who are considered at high risk. It is surprising that a population considered at such high risk, ie, with risk factors or equivalents for coronary artery disease, atherosclerosis, and stroke (that also resemble risk factors for male erectile dysfunction) has a similar—but not a higher—prevalence of ED. Any explanation of this unanticipated finding is lacking, and the association between vascular risk factors (as those stated in the paper such as diabetes, smoking, etc) with its potential consequences of endothelial dysfunction and ED confirms well known data. Also, only approximately 20% of men with ED were taking PDE-5 inhibitors, which seems to be relatively low compared to our experience. Many patients in the present study had contraindications for PDE-5 inhibitors because of concomitant use of nitrates and active myocardial ischemia. It is difficult to understand, however, how patients with ongoing myocardial ischemia should undergo rehabilitation (without control of ischemia) and why in others, nitrates could not be replaced (if clinically possible and indicated). As Goethe stated “knowing is not enough, we must apply; willing is not enough, we must do,” but before we can do, several issues should be addressed in order to better understand the issues of sexual dysfunction, in particular in patients with underlying cardiovascular diseases. The paper of Maroto-Montero et al¹ contains several statements that lack full scientific support and also adequate references from the literature. Published data on the prevalence of ED in men with heart failure is missing,³ and data on the true efficacy of PDE-5 inhibitors in high risk groups (such as diabetics) where effectiveness is clearly reduced are not discussed at all, not to mention the evolving dissatisfaction of a proportion of patients on long-term PDE-5 inhibitor treatment. On the other hand, with more than 100 million prescriptions per drug just after a few years of marketing PDE-5 inhibitors (in the US alone) its use has steadily increased but has not—in contrast to the authors suggestions—only been accepted by a “small” percentage of patients. The authors might therefore correlate the current numbers of prescription of sildenafil for example with the proposed number of 150 million men with ED worldwide, which—by the way—is underestimated. Moreover, the authors state that a cardiac rehabilitation program can be successful in the treatment of ED. Even though this would be of enormous value, both for the individual as well as economically, such effects have never been shown or convincingly studied. In contrast, a recent study showed that only dedicated sexual therapy could effectively improve frequency and quality of sexual activity in a cardiac rehabilitation patient program.⁴

Even though the idea of multidisciplinary action plans are mentioned, adequate references from the literature such as from combined ED clinics in the UK by Jackson

and others⁵ or our studies on the first multidisciplinary ED⁶ clinics in the US are not discussed. Moreover, female sexual dysfunction that is comprised of several subtopics such as hypoactive sexual disorder, female sexual arousal disorder, pain disorders among others,⁷ is not analyzed, even though it seems that the risk factors that might contribute to male ED are also risk factors for female sexual dysfunction⁸ and the prevalence of female sexual disorders appears to be as high as ED in men (at least in those with heart failure³).

In general, under-reporting appears to be a socio-cultural problem—at least to some extent—since populations from different cultural backgrounds might not be used to freely discuss sexual problems with health care providers.⁶

Quality of life issues were not tested in the present study. Further more, the effect of antidepressive medication on ED versus the effect of anxiety and major depression on sexual function have neither been evaluated nor discussed. Under-investigating (by physicians) and lack of knowledge with regard to effects and side effects and drug-drug interactions, for example between PDE-5 inhibitors and other cardiovascular medications further lead to problems that the authors mention briefly. In particular, beta-adrenergic receptor blockers have been controversially discussed with regard to its effects and side effects on sexual function and dysfunction.⁹ Further data regarding cardiac capacity, ejection fraction, cardiac performance, physical conditioning, heart failure, etc, that clearly can contribute to sexual dysfunction,¹⁰ would have been of interest. In addition, ED should not be considered an “all-or-nothing phenomenon.” Most questionnaires that attempt to semi-quantitatively estimate the severity of sexual problems in men therefore use a scoring system. The assessment and determination of erectile dysfunction (ED) was based on the Sexual Health Inventory for Men (SHIM). By using a cut-off score of 20, the authors identified 216 (52.6%) patients as having ED and conducted subsequent analyses based on this evaluation. The SHIM, a 5-item rating scale, is meant to be a screening tool, best used to obtain quick evaluation and identify those who need further evaluation. Without more careful further evaluation by specialists, this rigorous classification of ED might contribute to an inaccurate diagnosis of ED. It would be a marked improvement if a more comprehensive and detailed evaluation was conducted for assessment of ED.

It should be emphasized that no treatment cures ED, but ED scores might be improved, at least transiently, in men even with severe ED.

The authors should be commended for incorporating psychological measures, namely, depression and anxiety, in the study. The study found that anxiety and depression were concurrently associated with the presence of ED among patients in cardiac rehabilitation. A few issues related to these psychological measures, nevertheless, came to mind that raised some questions regarding the

role of psychological factors in patients in cardiac rehabilitation.¹ There was a lack of distinction between psychological symptom severity and clinically diagnosable disorders. In the study, depression was assessed by the Beck Depression Inventory (BDI), and anxiety by the Spielberger State Trait Anxiety Inventory (STAI). Instead of reaching clinical diagnoses, these measures gauge the symptom severity of anxiety and depression. The presence of depressive and anxiety symptoms, regardless of their severity, does not necessarily equate clinically diagnosable disorders. This is an important and fundamental distinction in research of psychopathology that was not clearly stated in this study. Especially problematic is the assessment of anxiety by the STAI. The STAI assesses both state anxiety and trait anxiety. The former measures the levels of anxiety arousal at the time of assessment, and the latter gauges the tendency of a stable personality to experience increased anxiety. Either is akin to measures of anxiety disorders as defined in the Diagnostic Statistical Manual of Mental Disorders IV (DSM-IV).² The rates of depression and anxiety disorders were surprisingly low. By applying the recommended cut-off scores, the authors stated that 6.7% of the patients reported notable depression, 11.4% for trait anxiety, and 15.7% for state anxiety. If we assume that these were acceptable thresholds to identify depressive and anxiety disorders, then it is noteworthy to point out that—compared to the literature—these prevalence rates were strikingly low in a cardiac rehabilitation program. For example, prior studies suggested that the prevalence rates of depressive disorders were estimated around 15% to 27%¹¹ and those of anxiety disorders might be as high as 36%.¹² In the studies by Todaro et al,^{11,12} the men in a cardiac rehabilitation program reported a 9% prevalence for depressive disorders and 25% for anxiety disorders. By any standards, the rates of depression and anxiety were apparently noticeable much lower in this program.³ As stated above, treatment of depression and anxiety was neither assessed nor reported. It was not clear if the authors assessed whether these men received any treatment for psychological disorders. Receiving treatment for anxiety or depression would undoubtedly affect responses on the anxiety and depression measures if the treatment was effective. Relying on self-reported measures, the study may under-estimate the actual rates of depression and anxiety. In addition, many medications for anxiety and depression, especially SSRIs, may have sexual side effects and induce sexual dysfunction.⁴ The role of psychological factors were unclear in conceptualization.

The authors did not articulate the roles of psychological factors (anxiety and depression) and their relations to ED in the study. Sexual dysfunction and ED are indeed a truly complicated phenomenon where physiological, psychological, and social factors are at play. Other than referring to these psychological factors as related conditions, there were no clear rationales and hypotheses to describe how they were relevant in the development

and persistence of ED. For example, both depression and anxiety can be either precipitating factors leading to the onset or exacerbation of ED or they can be consequences of experiencing ED. Compounded by a cross-sectional design, this study could not address the causal directionality between the ED and psychological factors, nor were we able to learn whether and how depression and anxiety may interact with physiological and biomedical factors to contribute to ED among these patients.⁵ Finally, there seemed to be no attempt to examine or discern whether depression and anxiety were separately or jointly associated with ED. Although depression and anxiety are 2 separate psychological constructs, the strong association between them is well recognized. The study did not report the correlations among depression, state anxiety, and trait anxiety, leaving us unable to evaluate whether they measured distinct or different aspects of psychological dysfunction. In the logistic regression analysis, it was not clear why only state anxiety, but not depression or trait anxiety, was included in the final model. Was it because that high correlations between psychological measures caused a multicollinearity problem, or that the effect of state anxiety was significantly stronger than the others? The authors did not provide any rationales and discussion on these issues that may have important theoretical and empirical relevance.

The conclusions of the study, that it is beneficial to provide “good information” to the patients, is not supported in the results presented. In order to give credit to the authors’ work in the current issue of the journal it is worth to mention that: *a*) it is absolutely necessary to address and study sexual dysfunction in men and women with underlying cardiovascular diseases (as done here), and *b*) a paper is worthy of publication if it creates controversial responses.

REFERENCES

1. Maroto-Montero JM, Portuondo-Maseda MT, Lozano-Suárez M, Allona A, de Pablo-Zarzosa C, Morales-Durán MD, et al. DE en pacientes incluidos en un programa de rehabilitación cardíaca. *Rev Esp Cardiol*. 2008;61:917-22.
2. Feldman HA, Goldstein I, Hatzichristou DG, Krane RJ, McKinlay JB. Impotence and its medical and psychosocial correlates: results of the Massachusetts Male Aging Study. *J Urol*. 1994;151:54-61.
3. Schwarz ER, Kapur V, Bionat S, Rastogi S, Gupta R, Rosanio S. The prevalence and clinical relevance of sexual dysfunction in women and men with chronic heart failure. *Int J Impot Res*. 2008;20:85-91.
4. Klein R, Bar-on E, Klein J, Benbenishty R. The impact of sexual therapy on patients after cardiac events participating in a cardiac rehabilitation program. *Eur J Cardiovasc Prev Rehabil*. 2007; 14:672-8.
5. Jackson G. A male cardiovascular sexual health clinic. *Int J Clin Pract*. 2002;56:631.
6. Schwarz ER, Rastogi S, Rodriguez JJ, Kapur V, Sulemanjee N, Gupta R, et al. A multidisciplinary approach to assess erectile dysfunction in high-risk cardiovascular patients. *Int J Impot Res*. 2005;17 Suppl 1:37-43.

7. Schwarz ER. Sexual function in women with heart disease and coronary artery disease. *Int J Impot Res.* 2007;19:341-2.
8. Berman JR. Physiology of female sexual function and dysfunction. *Int J Impot Res.* 2005;17 Suppl 1:44-51.
9. Rastogi S, Rodriguez JJ, Kapur V, Schwarz ER. Why do patients with heart failure suffer from erectile dysfunction? A critical review and suggestions on how to approach this problem. *Int J Impot Res.* 2005;17 Suppl 1:25-36.
10. Schwarz ER, Rastogi S, Kapur V, Sulemanjee N, Rodriguez JJ. Erectile dysfunction in heart failure patients. *J Am Coll Cardiol.* 2006;48:1111-9.
11. Todaro JF, Shen BJ, Niaura R, Tilkemeier PL. Prevalence of depressive disorders in men and women enrolled in cardiac rehabilitation. *J Cardiopulm Rehabil.* 2005;25:71-5.
12. Todaro JF, Shen BJ, Raffa SD, Tilkemeier PL, Niaura R. Prevalence of anxiety disorders in men and women with established coronary heart disease. *J Cardiopulm Rehabil Prev.* 2007;27:86-91.