



ORIGINAL ARTICLE

The patient's comorbidity burden correlates with the erectile dysfunction severity[☆]



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KEYWORDS

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Abstract

Objective: To explore the potential relationship between erectile dysfunction (ED), low testosterone levels, and the Charlson comorbidity index (CCI).

Material and methods: Cross-sectional study on patients referred to the andrology unit in 7 Spanish centers. The ED was diagnosed and graded using the International Index of Erectile Function (IIEF-5) score. Total testosterone, the prevalence of each comorbidity, and the CCI were compared between patients with different grades of ED. Besides, the correlation between total testosterone and the CCI score, the influence of each comorbidity, and the ED severity on the CCI was assessed in a multiple linear regression.

Results: The study included 430 men with a mean age of 61 years. The mean CCI was 3.5, and mean total testosterone 15.2 nmol/L; 389 (91%) subjects had some grade of ED: 97 (23%) mild, 149 (35%) mild-to-moderate, 86 (20%) moderate, and 57 (13%) severe. The increase in ED severity was significantly associated with a decrease in total testosterone ($P = .002$), and an increase in the CCI score ($P < .001$). Testosterone levels were significantly lower in patients

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PALABRAS CLAVE

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with obesity, diabetes, hypercholesterolemia, and hypertriglyceridemia ($P < .05$). However, only the prevalence of diabetes and hypertension was significantly associated with the severity of ED. The multivariate analysis including variables related to all assessed comorbidities, total testosterone levels, and the DE severity significantly predicted the CCI score ($P < .001$, $R^2 = .426$). The severity of ED significantly contributed to this model ($P = .011$), but total testosterone did not ($P = .204$).

Conclusions: The CCI is significantly associated with the ED severity, but it shows a weak correlation with the testosterone levels.

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El peso de la comorbilidad del paciente se correlaciona con la gravedad de la disfunción eréctil

Resumen

Objetivo: Explorar la relación entre la disfunción eréctil (DE), los niveles de testosterona y el Índice de comorbilidad de Charlson (ICC).

Material y métodos: Estudio transversal en pacientes derivados a la unidad de andrología de 7 hospitales españoles. La DE se diagnosticó y clasificó mediante el *International Index of Erectile Function*. Los niveles de testosterona, la prevalencia de cada comorbilidad y el ICC se compararon entre pacientes con distintos grados de DE. Además de la correlación entre la testosterona total y el ICC, la influencia de cada comorbilidad y de la severidad de la DE en el ICC se evaluaron mediante una regresión lineal múltiple.

Resultados: El estudio incluyó 430 hombres con una media de 61 años de edad. El ICC medio fue 3,5 y la testosterona total 15,2 nmol/l; 389 (91%) de los sujetos tenían algún grado de DE: 97 (23%) leve, 149 (35%) leve a moderada, 86 (20%) moderada y 57 (13%) severa. La severidad de la DE se asoció a un nivel menor de testosterona ($p = 0,002$) y a un mayor ICC ($p < 0,001$). Los niveles de testosterona fueron significativamente menores en pacientes con obesidad, diabetes, hipercolesterolemia e hipertrigliceridemia ($p < 0,05$). Sin embargo, únicamente la diabetes y la hipertensión mostraron una relación significativa con la DE. El modelo multivariado, que incluía variables relacionadas con todas las comorbilidades evaluadas, los niveles de testosterona y la severidad de la DE, predijo el ICC ($p < 0,001$, $R^2 = 0,426$). La severidad de la DE mostró una contribución significativa al modelo ($p = 0,011$), pero la testosterona total no ($p = 0,204$).

Conclusiones: El ICC se asocia significativamente con la severidad de la DE, pero muestra una correlación débil con los niveles de testosterona.

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Introduction

The worldwide prevalence rate of erectile dysfunction (ED) ranges from 22% to 30% in men aged 50–69 years, and reaches 37% in men between 70 and 75 years old.¹ As ED prevalence increases with age, patients suffering from ED often have to deal with other underlying comorbidities, which may contribute to deteriorating their health status.^{2,3} However, despite the influence of aging in the patient's comorbidity burden, both hypogonadism and ED have been independently associated with different comorbidities, particularly those identified as risk factors for cardiovascular disease.^{2,4–9} On the basis of this clinical association, and considering the mechanistic link between ED and the cardiometabolic dysfunction,^{10,11} it has been suggested that ED might be a manifestation of an underlying cardiovascular and metabolic disease.^{3,12} Therefore, some authors have proposed the presence of ED as a clinical marker for the detection of non-diagnosed cardiovascular and metabolic diseases.^{13–17}

Regardless of the individual impact of each particular comorbid condition on the patient's health, the assessment of the total comorbidity burden gives relevant information about life expectancy and future quality of life. The Charlson comorbidity index (CCI) was designed to estimate the overall risk of mortality based on the patient's comorbidity burden, and to control for comorbidities in studies assessing mortality.^{18–20} Beyond the association with the mortality risk, the CCI correlates with self-reported health²¹ and has shown to be useful in the identification of patients who are likely to incur high health costs.²²

Low testosterone levels have been directly associated with a greater risk of all-cause mortality^{17,23,24} and mortality resulting from major adverse cardiovascular events.^{23,25} However, to our knowledge, the relationship between testosterone levels and the patient's comorbidity burden by means of the CCI score has not been explored. On the other hand, ED has been associated with an increased risk of myocardial infarct – attributed to non-detected underlying cardiovascular diseases,²⁶ but its influence on all-cause

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