

ORIGINAL RESEARCH—ERECTILE DYSFUNCTION

Is Erectile Dysfunction a Reliable Proxy of General Male Health Status? The Case for the International Index of Erectile Function—Erectile Function Domain

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DOI: 10.1111/j.1743-6109.2012.02869.x

ABSTRACT

Introduction. Erectile dysfunction (ED) has emerged progressively as a sentinel marker of cardiovascular disease (CVD). The correlation between ED and the burden arising from multiple comorbid conditions has been incompletely analyzed.

Aim. Assess whether erectile function, defined with the International Index of Erectile Function–Erectile Function (IIEF-EF) domain score, is associated with health-significant comorbidities scored with the Charlson comorbidity index (CCI).

Methods. Clinical and hemodynamic variables of the last 140 consecutive patients who underwent penile color Doppler ultrasonography for new-onset ED were considered. Patients were assessed with a thorough medical and sexual history. Health-significant comorbidities were scored with the CCI.

Main Outcome Measure. Descriptive statistics and either linear or logistic regression models tested the association among IIEF-EF, hemodynamic parameters, and CCI, which was included in the model both as continuous and categorized variable (0 vs. ≥ 1).

Results. Complete data were available for 138 patients (98.6%) (mean age 46.6 years [standard deviation 13.0]; range 21–75 years). CCI was 0, 1, and ≥ 2 in 94 (68.1%), 23 (16.7%), and 21 (15.25%) patients, respectively. Of all, 35 patients (79.5%) did not have a CVD comorbidity. Mean IIEF-EF was 13.7 (9.3). ED severity was no ED, mild, mild to moderate, moderate, and severe in 12 (9.1%), 28 (20.2%), 12 (9.1%), 23 (16.2%), and 63 (45.5%) patients, respectively. At multivariable linear regression analysis, CCI significantly worsened with increased age ($\beta = 0.33$; $P = 0.001$) and decreased IIEF-EF values ($\beta = -0.25$; $P = 0.01$). At logistic regression analysis, age (odds ratio [OR]: 1.05; $P = 0.004$) and IIEF-EF (OR: 0.95; $P = 0.04$) emerged as significant predictors of categorized CCI.

Conclusions. Severity of ED, as objectively interpreted with IIEF-EF, accounts for a higher CCI, which may be considered a reliable proxy of a lower general male health status regardless of the etiology of ED. **Salonia A, Castagna G, Saccà A, Ferrari M, Capitanio U, Castiglione F, Rocchini L, Briganti A, Rigatti P, and Montorsi F. Is erectile dysfunction a reliable proxy of general male health status? The case for the International Index of Erectile Function—Erectile function domain. J Sex Med 2012;9:2708–2715.**

Key Words. Erectile Dysfunction; Erectile Function; International Index of Erectile Function; Comorbidities; Health Status

Introduction

Sexual health is a cornerstone aspect of overall health for both genders [1,2]. Data suggested that sexual health declines, while concomitant

morbidities increase among European men as a function of age [3]. More specifically, the older that men get, the more they become affected above all by hypertension, obesity, and heart disease; likewise, throughout their aging process, men start

dealing with erectile dysfunction (ED) and severe orgasmic impairment, both closely associated with concomitant comorbidities [3]. In this context, ED has progressively emerged as an important sentinel marker of men's overall health, assuming major relevance in the cardiovascular field [4–9]. This is particularly important in individuals with diabetes mellitus [10–15].

ED may significantly increase the risk of cardiovascular disease (CVD), coronary heart disease, stroke, overall atherosclerotic cardiovascular events [16], and all-cause mortality [4–9], and the increase is probably even independent of conventional cardiovascular risk factors [5,17], glycometabolic control, and ED severity [18,19].

Considering the importance of these findings, a comprehensive history along with a physical examination should become routine practice for sexual medicine specialists treating men with ED not just to investigate and study sexual health *per se* but, *quoad vitam*, to also evaluate the cardiovascular health profile of these men [11,17,20,21]. Recommending to the general practitioner to screen every man with an initial presentation of ED for standard cardiovascular risk factors and whenever necessary, to start cardioprotective interventions should also become a common practice [10,22,23].

It has been also demonstrated that ED is linked to different comorbid conditions and overall poorer male health [24–30]. The situation is further complicated by the fact that exactly because they are comorbidities, each comorbid disease can affect general health status, eventually having a negative impact on individual sexual health [31]. Overall, we fully endorse the idea of Corona et al. [32] and support the concept that ED represents an opportunity to screen for the presence of concomitant morbidities.

In this direction, we sought whether impaired ED *per se*, as objectively defined by the International Index of Erectile Function–Erectile Function (IIEF-EF) domain score [33,34], is associated with health-significant comorbidities, as scored with the Charlson comorbidity index (CCI) [35], in a cohort of consecutive Caucasian European heterosexual men complaining of new-onset ED as their primary sexual disorder.

Methods

Patients

From May 2010, clinical and ultrasound variables of the last 140 consecutive Caucasian European

heterosexual men who underwent dynamic penile color Doppler ultrasonography for new-onset ED of broad-spectrum etiology at the same academic outpatient clinic were considered for this analysis. Patients were assessed with a thorough medical history, including data on health-significant comorbidities as scored with the CCI [35], which is the most extensively studied hospital-based comorbidity index used by health researchers in their effort to measure comorbid disease status or case mix in health-care databases. Its original version contains 17 different disease comorbidity categories, each allocated a weight of 1–6 based on the adjusted relative risk of 1-year mortality and summed to provide a total score; the higher the score, the more severe the burden of comorbidity [35]. As a consequence, CCI sum is an indicator of disease burden and a strong estimator of mortality [35]. We used the *International Classification of Diseases*, 9th revision, Clinical Modification (ICD-9-CM) because its coding algorithms were used to define the 17 comorbidities that constitute the most widely used CCI. Measured body mass index (BMI), defined as weight in kilograms by height in square meters, was considered for each patient. For BMI, we used the cutoffs proposed by the National Institutes of Health [36]: normal weight (18.5–24.9), overweight (25.0–29.9), class 1 obesity (30.0–34.9), and class ≥ 2 obesity (≥ 35).

To provide a frame of reference for objectively interpreting ED severity, we used the IIEF-EF score [33] categorized according to the classification proposed by Cappelleri et al. [34]. For the specific aim of this study, we also considered the duration of ED before seeking medical help (number of months).

Symptoms of late-onset hypogonadism were not specifically collected for this cohort of men.

Dynamic penile color Doppler ultrasonography, using an intracavernosal injection of prostaglandin E₁ (PGE₁) (20 mcg) plus audiovisual and manual genital stimulation, was performed in all patients to assess penile hemodynamics. The test was conducted by three expert technicians (i.e., each performing >50 evaluations per year) according to the protocol previously reported by Montorsi et al. [37] with the specific purpose to obtain an erection comparable with the maximal physiological erection (that is the erection obtained at home during sexual activity). In this context, cavernosal peak systolic velocity (PSV), resistance index (RI), and acceleration (ACC) were bilaterally evaluated 20 minutes after intracavernosal PGE₁ injection [37].

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