RAPID COMMUNICATION

Prevalence of erectile dysfunction in chronic renal disease patients on conservative treatment

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INTRODUCTION

Erectile dysfunction (ED), the inability to maintain sufficient penile erection for satisfactory sexual performance, is highly prevalent in the general population, affecting almost 50% of men in the 40-70 years age range, which corresponds to approximately 150 million men worldwide (1,2). More recently, ED has been considered a manifestation of a functional and/or structural abnormality affecting penile circulation as part of a more generalized vascular disorder (2).

Erectile dysfunction, therefore, has been associated with signs of generalized arterial disease, as it frequently coexists with diseases with a high component of endothelial dysfunction, such as coronary artery disease, idiopathic systemic arterial hypertension, atherosclerosis, and end-stage chronic kidney disease (ESCKD). ED is also associated with cardiovascular disease risk factors, such as diabetes mellitus, dyslipidemia, and smoking (1-3).

Erectile dysfunction prevalence rates in men with chronic kidney disease (CKD) may reach 70-80%, with similar rates having been reported for those with ESCKD. A number of factors have been implicated in the development of ED in these patients, including the actual presence of a chronic disease, drugs, increased parathyroid hormone (PTH) serum levels, zinc deficiency, decreased testosterone serum levels, increased serum prolactin levels, and psychological factors (3,4).

MATERIALS AND METHODS

This study assessed the prevalence rate of ED in stage 3, 4, and 5 CKD outpatients and sought to identify the associations among ED, CKD stage, and comorbidities. ED was graded according to the International Index of Erectile Function (IIEF), which was validated for use in Portuguese (5).

No potential conflict of interest was reported.

We assessed 81 patients with a mean age of 61.7 ± 11.6 years (range: 21-84). The results included an estimated ED rate of 70%, significance level of 0.05, presumed error margin of 5%, and a population of 163 elements. The study databank was statistically analyzed with SPSS 13.0 software. For descriptive and bivariate analyses, only the valid cases were used. Logistic regression was used to characterize the relative weight of several variables studied on outcomes among the group of interviewed subjects. This study was approved by the ethics committee of the University Hospital of the Federal University of Juiz de Fora. During the history-taking visit, each subject received an explanation of the study and the shared patient/researcher responsibility in the study's success. Informed consent authorizing data collection was then obtained.

RESULTS

The prevalence of erectile dysfunction among those individuals aged 61 years or older was 85.1% compared with 66.7% of those ranging from 21 to 60 years in age ($p = 0.052$). The sample size may not have been sufficiently large to demonstrate a significant difference between the groups, as indicated in the literature. The prevalence of ED was 76.5% (62 patients), with 72.3% classified as stage 3 CKD, 81.5% as stage 4 CKD, and 85.7% as stage 5 CKD, although no statistically significant difference was found. Nineteen patients (23.5%) had no ED; 24 (29.6%) had mild ED; 15 (18.5%) had mild/moderate ED; 13 (16%) had moderate ED; and 10 (12.3%) had severe ED. Our study did not demonstrate any association between ED and most comorbidities considered to impart important cardiovascular risk, except diabetes mellitus, which reached significance as both a cause ($p = 0.004$) of kidney disease and comorbidity ($p = 0.006$; Tables 1 and 2).

Of the 81 patients assessed, 59 were aware of their CKD for 60 months at most. Among these patients, 86.4% had ED, while 50% of those aware of their CKD for longer than 61 months had ED ($p = 0.001$). Sixty-three patients were followed-up as outpatients for 60 months at most; 82.5% had ED compared with 55.6% of those followed up for longer than 61 months ($p = 0.017$; Table 3).

The logistic regression model revealed that among subjects with ED, those with diabetes mellitus were 4.05 times more likely to have ED than non-diabetic subjects

Table 1 - Bivariate analysis of the association between erectile dysfunction and diabetes mellitus.

Variable		With dysfunction N (%)	*p*-value
Diabetes mellitus	YES	29 (93.6)	0.004*
	NO	33 (66.0)	

($p = 0.048$). However, subjects aware of their CKD for a period of less than 60 months were 3.5 times more likely to have ED than those who were aware of their CKD for longer periods ($p = 0.012$; Table 4).

DISCUSSION

The high prevalence of ED (76.5%) among CKD patients is compatible with published reports (4). The prevalence of ED among those who were aware of their CKD for less than 60 months was higher than that among subjects who were aware of their CKD for 61 months or more. The former group was 3.5 times more likely to have ED ($p = 0.012$; CI 1.4–14.489). These data may indicate greater clinical, metabolic, and inflammatory imbalances among those who were more recently aware of their CKD and consequently had shorter follow-up times, a condition that theoretically favors a higher prevalence of ED (4,7-9). Therefore, this trend may also reflect a major public health issue, because these patients are likely to require specialized treatment. This study found a 93.6% ED prevalence rate among 31 patients with diabetes mellitus as a cause of their CKD, compared with a 66% ED prevalence rate among non-diabetic subjects ($p = 0.004$). For those with diabetes mellitus as a comorbidity, the prevalence of ED was 93,5%, which is in agreement with the literature (3,4). Diabetic patients were 4.05 times more likely to have ED compared with non-diabetic subjects.

In conclusion, our study found a high prevalence rate of ED among CKD patients on conservative treatment. There was a strong association with diabetes mellitus, either as a cause of the renal disease or as a comorbidity, and disease duration. We understand that inflammation, which is common in these patients (6-8), may account for the high prevalence rate of ED in this study. The presence of inflammation may point to the possibility of an early diagnosis of a generalized endothelial disease that is amenable to screening at the first nephrological consultation through a simple but efficient clinical approach.

The utilization of 5-phosphodiesterase inhibitors represents a novel therapeutic approach used to improve endothelial function (10). When administered daily to CKD patients, this treatment can prevent or delay the development of kidney disease as a consequence of reduced inflammation in the endothelium.

Table 2 - Bivariate analysis of the association between erectile dysfunction and other variables.

Variables	% with Erectile Dysfunction	*p*-value
DM[2]	93.5	0.006 *
Caucasian	77.2	0.832
Smoker (current or former)	78.9	0.631
SAH[1]	77.6	0.367
Dyslipidemia	71.4	0.619
CAD[3]	85.7	0.549
PVD[4]	100	0.125
Stroke[5]	66.7	0.553
ACEI[5]	79.3	0.351
ARB[6]	76.3	0.964
CCB[7]	69.4	0.177
Diuretics	77.6	0.619
ALPHA-ADREN[8]	83.3	0.683
BETA-BLOCK[9]	82.8	0.324
Vasodilator	100	0.256
Nitrate	100	0.329

*p-value<0.05.

1-Systemic Arterial Hypertension; 2-Diabetes Mellitus; 3-Coronary Artery Disease; 4-Peripheral Vascular Disease; 5-Angiotensin-converting Enzyme Inhibitor; 6-Angiotensin Receptor Blocker; 7-Calcium-Channel Blocker; 8-Alpha-adrenergics; 9-Beta-blocker.

Table 3 - Bivariate analysis of the association among erectile dysfunction, the length of disease and the length of follow-up.

Variable		With dysfunction	*p*-value
Length of disease	Less than 60 months	51(86.4)	0.001*
	Equal to or more than 61 months	11(50)	
Length of follow-up	Less than 60 months	52(82.5)	0.017*
	Equal to or more than 61 months	10(55.6)	

*p-value<0.05.

Table 4 - Logistic regression model for the association between erectile dysfunction, diabetes mellitus and the duration of chronic kidney disease.

Variable		Odds ratio	*p*-value	CI (95%)
Diabetes Mellitus	Yes	4.05	0.048*	1.017 – 25.085
	No	1		
Length of Disease	Less than 60 months	3.50	0.012*	1.400 – 14.489
	Equal to or more than 61 months	1		

Analysis in relation to the ''with erectile dysfunction'' group of individuals.
*p-value<0.05.

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AUTHOR CONTRIBUTIONS

Mesquita JFP was the researcher in charge of gathering and analyzing data as well as orienting students involved with this work; he is an expert on Brazilian healthcare. Ramos T and Mesquita FP are medical students from Faculdade de Medicina da Universidade Federal de Juiz de Fora who are in charge of interviewing patients and obtaining data. Netto JMB and Bastos MG are co-advisors on this study. Figueiredo AA is an advisor on this study.

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