ORIGINAL RESEARCH ARTICLE

Sexual dysfunction in hemodialysis patients: Prevalence and risk factors in Morocco

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Abstract

This research was designed to investigate the prevalence and risk factors associated with sexual dysfunction in women with chronic renal failure on hemodialysis in the Marrakech-Safi region of Morocco. A questionnaire was distributed to 225 sexually active married CKD patients undergoing hemodialysis. Their results were compared with those of 120 healthy, sexually active married women matched for age and socioeconomic class. The present study showed that 76.4% of the women had sexual dysfunction. The total sexual function scores of hemodialysis patients (19.44 ± 6.3) were significantly lower than those of the control group (27.42 ± 4.8; p < 0.001). Sexual dysfunction was influenced by age (OR = 2.721; CI 2.168–3.745; p<0.001), etiology of chronic renal failure (OR = 4.645; CI 2.783–7.286; p 0.001), biological data (OR = 5,837; CI 5,112–9,371; p<0.001), associated co-morbidity (OR = 2,193; CI 1,424–3,412; p 0.01), and months of dialysis duration (OR = 3,345; CI 1,215–10,573; p<0.05). This study revealed a significant prevalence of sexual dysfunction, and more effort in diagnosis and management should be made. *(Afr J Reprod Health 2023; 27 [10]: 103-110).*

Keywords: Chronic renal failure, hemodialysis, sexual dysfunction, risk factors, prevalence

Résumé

Cette recherche a été conçue pour connaître la prévalence et les facteurs de risque associés à la dysfonction sexuelle chez les femmes souffrant d'insuffisance rénale chronique sous hémodialyse à la région de Marrakech-Safi au Maroc. Un questionnaire a été distribué à 225 patientes atteints d'IRC au stade d'hémodialyse, mariées sexuellement actives. Les résultats obtenus ont été comparés à ceux de 120 femmes mariées sexuellement actives en bonne santé appariées selon l'âge et la classe socioéconomique. La présente étude a montré que 76.4 % des femmes avaient une dysfonction sexuelle. Les scores de la fonction sexuelle totaux des patientes hémodialysées (19,44 ± 6,3) étaient significativement inférieurs à ceux du groupe témoin (27,42 ± 4,8 ; p < 0,001). La dysfonction sexuelle était influencée par l'âge (OR= 2,721; CI 2,168 -3,745 ; p<0.001), l'étiologie de l'insufisance rénale chronique (OR=4,645 ; CI 2,783 - 7,286 ; p<0.001), les données biologiques (OR=5,837; CI 5,112 - 9,371; p<0.001), les comorbités associées (OR=2,193; CI 1,424 - 3,412; p<0.01) et la durée de dialyse en mois (OR=3,345; CI 1,215 - 10,573 ; p<0.05). Cette étude a révélé une prévalence importante de la dysfonction sexuelle et plus d'effort en matière de diagnostic et de prise en charge devraient être fait. *(Afr J Reprod Health 2023; 27 [10]: 103-110).*

Mots-clés: Insuffisance rénale chronique, hémodialyse, dysfonction sexuelle, facteurs de risques, prévalence

Introduction

Renal function is essential to human homeostasis[1]. Chronic kidney disease (CKD) is a major health problem worldwide. Estimated population prevalence exceeds 10% and continues to rise[2]. According to the MARIMAR study, the prevalence of chronic kidney disease in Morocco is 5.1 new patients per million inhabitants, 7.2% of whom are in end-stage renal failure[3]. CKD has a serious impact on survival rates and quality of life, including sexual function[4]. Sexuality is an important component of overall quality of life[5]. Hemodialysis has certainly changed the prognosis of chronic renal failure patients for the better. However, in addition to the burden of kidney disease, this heavy therapy weakens the psychic balance of the subjects and has several repercussions on the various aspects of their lives. Sexuality is one of the aspects most affected[5]. Sexual dysfunction (SD) is defined as any abnormality of sexual arousal, desire, intercourse,

orgasm, or satisfaction. It's a subject most people are reluctant or embarrassed to broach and is rarely addressed. It is answered in patients with chronic and end-stage renal failure, with 70% to 84% of men and 30% to 60% of women reporting some form of sexual dysfunction[6]. Erectile dysfunction, associated with reduced libido and difficulty achieving orgasm, is present in 70% of male patients[7]. Patients suffer from impaired vaginal lubrication, loss of arousal and desire, dysmenorrhea, and difficulty reaching orgasm[7,8]. Sexual complaints in female patients are twice as frequent as in the healthy population[9]. Patients on renal dialysis report higher rates of decreased sexual desire and ability. In both types of dialysis, the prevalence of measured DS is around 65% for men and 70% for women[10]. In the case of hemodialysis, the prevalence is even higher among women, rising to 84%[9].

The etiology of DS in CKD patients is due to a variety of underlying conditions, including a uremic environment, anemia, cardiovascular disease, mineral and bone disease, sex hormones, autonomic neuropathy, hyperparathyroidism, and hyperprolactinemia. In addition, the presence of sexual dysfunction is the result of drug side effects, comorbidities (cardiovascular disease, diabetes, and malnutrition), and psychosocial factors. Psychosocial factors include depression, anxiety, low self-esteem, marital discord, social withdrawal, body image problems, and fear of disability and death[7,11-13]. In relation to the growing awareness of erectile dysfunction in men undergoing hemodialysis[12], sexual dysfunction in women with CKD is less well understood and studied. Studies of female sexual dysfunction in CKD report a wide variation in the prevalence of sexual difficulties (30% to 100%) in these women[14,15].

To date, no study has assessed the prevalence of CKD-related female sexual dysfunction in our setting. A descriptive study is now essential to understanding the prevalence, severity, and key correlates of sexual dysfunction in women with CKD on hemodialysis and determining whether future research to evaluate health outcomes and screening and intervention strategies is warranted. Thus, in this study, we sought to assess the effect of CKD on sexual function in sexually active female patients, comparing them to uninfected controls using the FSFI as a measurement tool.

Methods

Study setting

The study was conducted in the region of Marrakech-Safi that which covers an area of 41,404 km2, i.e. 6% of the national territory. It comprises the prefecture of Marrakech and seven provinces: of Chichaoua, El Haouz, El Kelaa des Saraghna, Rahamna, Essaouira, Safi, and Youssoufia[16,17]. In terms of health infrastructure, the province has 68 primary health care facilities both and urban areas, a single hospital with a bed capacity of 310 functional beds, a single hemodialysis center and a poorly developed private sector[17].

Design

This is a case-control study carried out in the six dialysis centers in the Marrakech-Safi region. The study lasted six months, from December 1, 2022, to May 31, 2023. Our study population consisted of 225 sexually active married CKD patients at the hemodialysis stage. Their results were compared with those of 120 healthy, sexually active married women matched for age and socioeconomic class. All subjects signed an informed consent form before participating in the study.

Patients undergoing peritoneal dialysis were excluded. Inclusion criteria were: to have been on dialysis for at least three months at the time of the study; to be over 18 years of age; and being informed by the treating physician about the study‘s purpose.

The questionnaire was administered individually and confidentially during the hemodialysis session, and included 30 items concerning: general characteristics of the study population, data concerning hemodialysis (length of time, number of sessions per week, duration of session, biological characteristics), and sexuality characteristics using the Female Sexual Function Index (FSFI) questionnaire. The FSFI is a questionnaire that measures sexual functioning in women[18]. It is a 19-item questionnaire that assesses six domains of sexual function (desire, arousal, lubrication, orgasm, satisfaction, and pain), enabling different groups to be compared. The FSFI was first validated in a study of patients with female sexual arousal disorder and matched normal controls. A total FSFI score of 26.55 was found to be the optimal threshold for differentiating between women with and without sexual dysfunction (SD)[19,20]. This study

has been approved by the ethics committee and the health authorities.

Data management and analysis

IBM®SPSS® version 18 (Statistical Package for the Social Sciences) was used for statistical input and analysis. Qualitative variables were described by numbers and proportions, and quantitative variables by their measures of central tendency and dispersion. Logistic regression was used to eliminate confounding factors and capture the weight of variables associated with sexual dysfunction. Statistical significance was set at the 5% threshold. A total FSFI score of 26.556 was used to distinguish participants with and without sexual dysfunction. The proportions of patients and controls with scores below the threshold were compared, and the total and domain FSFI scores of patients with CKD were compared with those of controls.

Results

Characteristics of the studied groups

Table 1 shows the socio-demographic and socio-economic characteristics of the study groups. The mean age of women receiving hemodialysis was 46.7 (SD = 9.2), 64.5% of whom were over 35. Urban women accounted for 36.8% and rural women for 63.2%. The illiteracy rate was 28.8%, and 44.4% had not completed primary school. The percentage of women with secondary education or higher was 28.8%. Socioeconomic status was low for 52.5% of patients. With regard to health insurance, 57.7% had no social security coverage. For controls, the mean age was 45.3 (SD = 7.4). Urban women accounted for 39.2%. The illiteracy rate was 27.5%. Socioeconomic status was low at 58.3%. With regard to health insurance, 55.8% had no social security coverage. Patients and healthy controls were matched based on sociodemographic and socioeconomic characteristics (all $p > 0.05$).

Table 2 shows the health characteristics of the patients. A significant number of women lived more than six kilometers from the hemodialysis center. With regard to the comorbidities associated with CKD, diabetes accounted for 45.7% of cases. Similarly, for the etiology of CKD, diabetic nephropathy accounted for 47%. Triglyceride levels averaged 174.5 (SD = 116.3).

Prevalence of sexual dysfunction

Figure 1 shows the prevalence of sexual dysfunction in female patients. A total of 132 patients (58.6%) scored below 20. The number of women with scores between 21 and 30 was 50 (22.3%), and only 43 (19.1%) had scores above 30. 172 patients (76.4%) had total FSFI scores indicating sexual dysfunction (SDF) at 26.55.

Sexual function in patients and healthy controls

The distribution of mean scores for individual dimensions of sexual function in hemodialysis patients and controls is summarized in Table 3.

The mean score for pain during intercourse was 3.18 ± 1.08 for hemodialysis patients and 4.81 ±1.91 for controls. The mean score for sexual desire was 3.67 ± 0.72 for hemodialysis patients and 5.08 ±0.80 for controls. The mean score for degree of lubrication was 3.43 ± 0.82 for haemodialysis patients and 4.86 ± 1.60 for controls. The mean sexual satisfaction score was 2.36 ± 1.06 for haemodialysis patients and 4.01 ± 2.17 for controls. The clitoral sensation score was 3.29 ±1.25 for haemodialysis patients and 4.83 ± 1.93 for controls. The mean orgasm score was 3.62±0.86 for haemodialysis patients and 5.04 ± 1.38 for controls. In sum, the total FSFI scores of haemodialysis patients (19.44 ± 6.3) were significantly lower than those of the control group (27.42 ± 4.8; $p < 0.001$).

According to the univariate logistic regression model Table 4, the socio-demographic, economic, and health factors that represent significant and independent determinants of sexual dysfunction in hemodialysis patients are numerous: duration of dialysis in months (OR = 0.267; CI 0.133–0.545), age of women (OR = 0.429; CI 0.343–0.447), socio-economic level (OR = 0.305; CI 0.113–0.826), distance to emodialysis center (OR = 0.587; CI 0.362–0.970), etiology of chronic renal failure (OR = etiology of chronic renal failure (OR = etiology of chronic renal failure (OR = 0.078–0.281), associated co-morbidity (OR = 5.649; CI 1.158–28.145), and clinical characteristics (OR = 0.334).

Additionally, the model created through multivariate logistic regression (table 4) reveals that the significant and independent factors that increase

Table 1: Socioeconomic and demographic characteristics of the studied groups

Variables		Patients Number (%)	Controls Number (%)	*p*
Age years		46.7 ± 9,2	45.3 ±7.4	0.373
Age	< 35	80 (35.5)	45 (37.5)	0.484
	≥ 35	145 (64.5)	75 (62.5)	
Place of residence	Urban	83 (36,8)	47 (39.2)	0.629
	Rural	142 (63.2)	73 (60.8)	
Educational level	Literate	60 (28.8)	33 (27.5)	0.954
	Primary	100 (44.4)	55 (45.9)	
	Secondary and above	65 (28.8)	32 (26.6)	
Socio-economic level	Low	118 (52,5)	70 (58.3)	0.324
	Medium to high	107 (47,5)	50 (41.4)	
Social security cover	Yes	95 (42.3)	53 (44.2)	0.532
	No	130 (57.7)	67 (55.8)	

Table 2: Hemodialysis patients' health characteristics

Variables		**Number (%)**
Months of dialysis duration		23,2 ± 11,7
Distance to emodialysis center	< or = 3km	44 (19.6)
	>3km and < or = 6 km	79 (35)
	>6 km	102 (45.4)
Associated comorbidity	Hypertension artérielle	70 (31.1)
	Diabète	103 (45.7)
	Autres	52 (23.2)
Etiology of CKD	Diabetic nephropathy	106 (47)
	Hypertensive nephropathy	26 (11.6)
	Chronic glomerulonephritis	61 (27)
	Lupus nephritis	5 (2.5)
	Polycystic kidney disease	8 (3.5)
	Undetermined	19 (8.4)
Biological data	Albumine ***g/dL***	4,2 ± 0.4
	Hematocrit %	28,7 ± 4.5
	Triglyceride ***mg/dL***	174,5 ± 116.3
	Serum iron µg/dL	74.8 ± 32.8
	Total cholesterol mg/dL	204,7 ± 44.2
	Serum uric acid mg/dL	6,9 ± 1.8

%:Percentage; Km: kilometer; g: gram; mg: milligrams; dL: deciliter; µg: micrograms

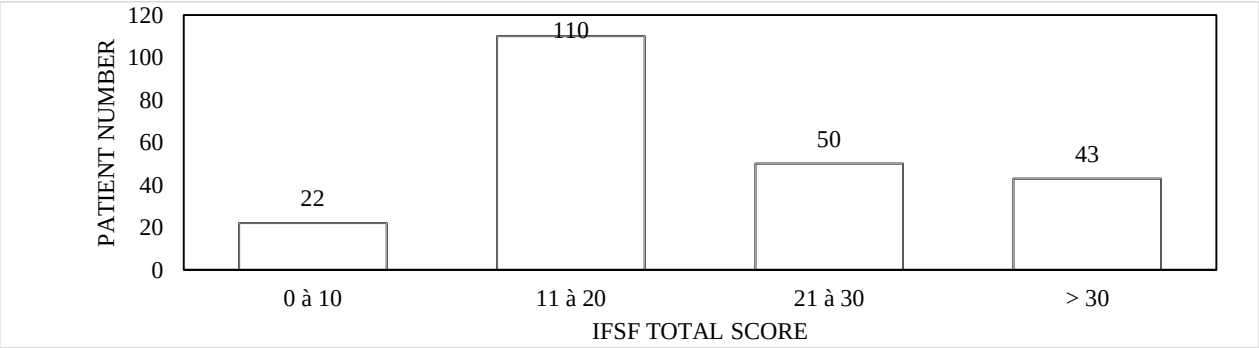

Figure 1: Prevalence of sexual dysfunction in female patients

Table 3: FSFI scores for hemodialysis patients and controls (mean ± SD)

Item	Patients N= 225	Controls N= 120	*p*
Pain	3.18 ± 1.08	4.81 ±1.91	<0.001*
Sexual desire	3.67 ± 0.72	5.08 ±0.80	<0.001*
Sexual satisfaction	2.36 ± 1.06	4.01 ± 2.17	<0.001*
Degree of lubrication	3.43 ± 0.82	4.86 ± 1.60	<0.001*
Ability to reach orgasm	3.62±0.86	5.04 ± 1.38	<0.001*
Degree of clitoral sensation	3.29 ±1.25	4.83 ± 1.93	<0.001*
Total score	19.44 ± 6.3	27.42 ± 4.8	<0.001*

SD: standard deviation; *: Statistically significant at p < 0.05

Table 4: Univariate and multivariate analysis of factors associated with sexual dysfunction in hemodialysis patients

Variables	Univariate logistic analysis					Multivariable logistic analysis				
	A	χ2	OR	IC		A	χ2	OR	IC	
Months of dialysis duration	-1,268	9,176**	0,267	0,133	0,545	1,357	5,398*	3,345	1,215	10,573
Age	-1,135	51,211***	0,429	0,343	0,447	1,152	42,741***	2,721	2,168	3,745
Place of residence	-0,239	0,924ns	0,974	0,737	1,290	0,143	0,145ns	1,144	0,846	1,562
Educational level	1,057	3,322ns	2,877	0,923	8,966	1,093	3,573ns	2,984	0,960	9,269
Socio-economic level	-1,186	5,457*	0,305	0,113	0,826	1,087	0,256ns	1,255	0,957	1,673
Distance to emodialysis center	-0,528	4,535*	0,587	0,362	0,970	0,433	1,853ns	1,309	0,762	2,313
Etiology of chronic renal failure	-1,870	41,457***	0,165	0,078	0,281	1,660	27,804***	4,645	2,783	7,286
Associated co-morbidity	1,712	23,327***	5,649	1,158	28,145	0,623	9,827**	2,193	1,424	3,412
Biological data	-1,968	57,868***	0,251	0,176	0,334	1,818	61,212***	5,837	5,112	9,371

*A: Constant, 2: Chi-square value, OR: Odds ratio, CI: Confidence interval; * p<0.05; **p<0.01; ***p<0.001; ns: non significatif*

a woman's risk of experiencing sexual dysfunction were age (OR = 2.721; CI 2.168–3.745; p<0.001), etiology of chronic renal failure (OR = 4,645; CI 2,783–7,286; p<0.001), biological data (OR = 5,837; CI 5,112–9,371; p<0.001), associated co-morbidity (OR = 2,193; CI 1,424–3,412; p<0.01) and months of dialysis duration (OR = 3,345; CI 1,215–10573; p 0.05).

Discussion

It has been shown that sexual disorders are frequently encountered in CKD patients undergoing hemodialysis[21,12]. These patients suffer from multiple comorbidities (hypertension, diabetes, and depression), which occur with greater frequency than in the general population. The present study confirms the importance of these disorders in our patient population (76.4%), which are associated with other factors leading to a deterioration in quality of life. This finding corroborates the results of other studies in other contexts[18,22,21]. This result corroborates the study by Yilmaz *et al.* on sexual dysfunction in postpartum Turkish women, which states that 74.3% of postpartum women have experienced sexual dysfunction[23].

The diagnosis and treatment of these sexual disorders must be part of the overall management of the patient. In fact, these disorders were more frequent in CKD patients on hemodialysis than in the general population, despite significant advances in CKD management over the last few decades[11]. The mean IFSF score was only 19.44 ± 6.3, comparable to the control score of 27.42 ± 4.8 (p<0.001). This score was probably lower than that of a multicenter study of sexual dysfunction in women undergoing hemodialysis in Taiwan[15], of a study on sexual dysfunction and associated risk factors in women with end-stage renal disease in Turky[18], a report from Egyptian patients with chronic hepatitis C[24]. It

is close to that of the study on the effects of the COVID-19 pandemic and its containment on women's sexual function and reproductive health pre-pandemic and during containment (19.3 ± 6 vs. 21.3 ± 6.4, P<0.001) in Egypt[25].

These observations imply that the prevalence of sexual dysfunction in our hemodialysis subjects is high. Many factors are involved in sexual dysfunction in women undergoing hemodialysis. According to the literature. The literature shows that the onset of sexual dysfunction is age-related[14,18,26]. Strippoli *et al*. carried out one of the largest studies of sexual dysfunction in 1472 women with CKD in the hemodialysis stage and found that its onset was intimately related to age, menopause, and educational level. In our study, age was significantly associated with the occurrence of these disorders (OR = 2.721; CI 2.168–3.745; p<0.001). In the present study, dialysis duration was associated with the occurrence of sexual dysfunction (OR = 3.345; CI 1.215–10.573; p<0.05). In contrast, several studies found that the duration of dialysis did not influence the occurrence of sexual dysfunction[10-12].

There was a link between the etiology of CKD and the occurrence of sexual dysfunction in our patients (OR = 4.645; CI 2.783–7.286; p<0.001), mainly CKD of presumed origin and diabetes (47%). This is in line with the literature, which suggests that diabetic nephropathy is a key risk factor for sexual dysfunction[15,1]. The same applies to cardiovascular risk factors and hypertension. The existence of associated comorbidity, a factor usually encountered in chronic renal failure, was significantly associated with the occurrence of sexual disorders (OR = 2.193; CI 1.424–3.412; p<0.01), which may be explained by the altered general condition induced by this factor. The biological characteristics of our target population had a significant influence on the occurrence of sexual dysfunction (OR=5.837; CI 5.112 - 9.371; p<0.001), notably hypertriglyceridemia. Indeed, according to the study by Peng *et al.* (2005), hypertriglyceridemia was strongly associated with dysfunction in the dimensions of quality, desire, clitoral lubrication, orgasms, and clitoral sensation (P = 0.001, P < 0.001, P 0.005, P 0.013, and P< 0.001, respectively). Furthermore, hypertriglyceridemia was associated with lower total IFSF scores (P < 0.001). This implicates vascular insufficiency as a major cause of sexual dysfunction in our hypertriglycemic patients[15].

It should be noted that the present study has certain limitations that warrant acknowledgment. Indeed, the data represented a group of patients treated exclusively by hemodialysis, so other therapeutic means, namely peritoneal dialysis and renal transplantation, could not be evaluated. The use of standardized, reliable questionnaire to evaluate women's sexual is one of the study's advantages.

Conclusion

The therapy of sexual dysfunction should be incorporated into patient care strategies because it should be recognized as a significant issue impacting the quality of life of CKD patients receiving haemodialysis. In fact, taking it into consideration will enhance the quality of life for patients.

Patients and their families require social, educational, and financial support in addition to adequate care to help them deal with the stigma associated with CKD and its socioeconomic consequences. To learn more about the pathogenesis of these disorders, additional research in this area can build on these discoveries. By optimizing influencing factors and closely monitoring biological and hormonal processes, a comprehensive strategy can then be formulated

Ethical considerations

To participate in this study, participants provided their free and informed consent. Additionally, they were made aware of the nature of the study, its authors, its goals, and the confidentiality of the information gathered in advance. An authorization from the Bioethics Consultative Commission Faculty of Sciences Agadir (CCBE-FSA Ref. No.: FCR-CS/2023-0002) as well as the authorization to collect data from the health authorities (the regional health directorate of the Marrakech region-Safi from Marrakech-Safi) were obtained.

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Conflict of interest

No link of interest is associated with this work.

Contribution of authors

We declare that this work was carried out by the authors named in this manuscript and that all the responsibilities related to the claims relating to the content of this article will be borne by the authors. Jaouad Chouikh designed the study and participated in data acquisition, literature search, data analysis, and manuscript writing. Samia Rkha, Saloua Ait El Haj, Nezha Nacer, Hicham Mejdouli, and Nadia Ouzennou conducted data analysis, and read and approved the manuscript for publication. All authors read the manuscript and approved the final version for publication.

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