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Profile of Sexual Disorders in Chronic Hemodialysis Patients at the Boubacar Diallo National Hospital in Niamey (Niger)

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Abstract

Introduction: Hemodialysis has favorably improved the prognosis of patients with end-stage renal failure. However, this heavy therapy is accompanied by an imbalance in various aspects of these patients' lives. Sexuality is one of the most affected areas. **Aim:** To study the epidemiological, clinical and biological profile of chronic hemodialysis patients with sexual dysfunction in the Nephrology department of the Amirou Boubacar Diallo National Hospital in Niamey (HNABD). **Method:** This was a prospective, cross-sectional, analytical study of 100 cases collected over a period of six months from February to July 2023. **Results:** The frequency of sexual disorders was 98%; male gender represents 80% of cases. The mean age of our patients was 44.2 ± 1.2 years. AVF was used in 90% of cases. 98% of cases had two four-hour sessions per week. Hypertension was the comorbidity found in 67% of patients. Chronic glomerulonephritis was the etiology of end-stage chronic renal failure in more than half of the patients in 52% of cases. Functionally, libido disorder represented 87% of cases, sexual asthenia 68%, orgasm disorder 54%, ejaculation disorder 41%, menstrual disorder in 8% of cases, and sterility 2%. According to the IIEF5, erectile dysfunction was severe in 28%, moderate in 33%, and mild in 30%. According to the FSFI, 95.6% of female patients had sexual dysfunction. More than a quarter of patients (36% or n = 36) had hypogonadism in men. Almost all patients (92% or n = 92) had a hemoglobin level below 11 g/dl. Severe and moderate sexual dysfunction were positively correlated in patients

over 60 years of age (p = 0.009 and p = 0.02), but also in hypertensive patients with mild sexual dysfunction and those whose IIEF was uninterpretable (p = 0.03 and p = 0.04). This association was also statistically significant in male diabetic patients with severe and moderate disorders (p = 0.02 and p = 0.04), but also in anemic patients (p = 0.05). **Conclusion:** Sexual disorders must be considered as a major factor affecting patients' quality of life, and their management must be included in the therapeutic strategies of these patients.

Keywords

Hemodialysis Patients, Sexual Dysfunction, Niger

1. Introduction

Chronic kidney disease (CKD) is a growing public health problem, affecting approximately 9% - 16% of the global population [1].

The care of patients with end-stage chronic renal failure has evolved significantly in recent decades, leading to an increase in their life expectancy. This is particularly true through extrarenal purification techniques (peritoneal dialysis and hemodialysis) and kidney transplantation.

Certainly, hemodialysis has favorably changed the prognosis of chronic renal failure in patients. However, this heavy therapy is accompanied by biological and psychological imbalances. It alters patients' quality of life. Sexuality is one of the most affected areas. Sexual dysfunction is a fairly common and little-explored problem. Despite its prevalence, very few patients discuss it with their doctor, mainly for social, economic and traditional reasons [2].

Sexual disorders, which are difficulties in having satisfactory sexual intercourse, constitute a real problem faced by chronic hemodialysis patients.

These include erectile dysfunction, loss of libido, ejaculation disorders and difficulty reaching orgasm, gynecomastia, menstrual irregularities, reduced vaginal lubrication, lack of energy, dyspareunia and infertility.

But erectile dysfunction remains the most studied in the literature [3]. In a meta-analysis, the prevalence of erectile dysfunction in men with end-stage renal disease was 71% (95% CI: 67% - 74%, I2 = 92%) [4].

However, sexual dysfunction in women has been less studied [3]. Yet reported prevalences were as high as 80% [5]-[7].

Several African studies have also demonstrated this high prevalence of sexual dysfunction in haemodialysis patients: in Niger (98.33%), Senegal (84.9%) and Tunisia 86.48% [8] [9] and [10].

These sexual dysfunctions have multifactorial etiologies, and most often combine organic and psychogenic factors [2] [3].

Diabetes mellitus and uremia cause autonomic neuropathy, which in turn leads to erectile dysfunction [11] [12]. Anemia, frequently observed in chronic kidney

disease, is accompanied by reduced oxygen supply to the corpora cavernosa and contributes to loss of libido and erectile dysfunction. Treatment with recombinant human erythropoietin improves sexual desire and performance, and improves erectile dysfunction in some male CKD patients [13].

It has also been shown that increased prolactin and parathyroid hormone levels, as well as decreased testosterone, are associated with the onset of sexual dysfunction [14] [15].

The onset of erectile dysfunction also leads to a reduction in quality of life, which is a risk factor for the development of depression. Moreover, depression is considered an independent factor in the onset of sexual dysfunction, particularly in men with CKD [16]-[18].

Despite this high prevalence and the negative impact on patients' quality of life, sexual disorders still constitute a taboo subject in our society. Hence the interest of this work, in order to determine the clinico-biological profile of patients with sexual dysfunctions and propose therapies that can improve patients' sexual health.

2. Methodology

We carried out a prospective, cross-sectional and analytical study over a period of six (6) months, from February to July 2023 in the Nephrology Department of the Amirou Boubacar Diallo Hospital (HNABD) in Niamey.

The study included patients on chronic hemodialysis for more than three months and presenting sexual disorders. For data collection, we used two psychometric tests adapted to our context:

- For men the International Index of Erectile Function (IIEF) and
- For women the Female Sexual Function Index (FSFI)

Score IIEF5: is a simplified version of the International Index of Erectile Function, is a self-administered questionnaire in 5 questions with the answer rated from 0 to 4 or 5 per question. IIEF5 allows a semi-quantified assessment of sexual function. It was developed in the United States by Professor Rosen and has since been translated in many languages.

Interpretation: Severe erectile dysfunction (score of 5 to 10),
Moderate erectile dysfunction (11 to 15),
Mild erectile dysfunction (16 to 20),
Normal erectile function (21 to 25),
Uninterpretable (1 to 4).

Score FSFI: The Female Sexual Function Index is a self-administered questionnaire comprising 19 items to be assessed on Likert scales. These items describe six domains of sexual functioning: desire (two items), arousal (four items), lubrication (four items), orgasm (three items), satisfaction (three items) and pain during sexual intercourse (two items). The Female Sexual Function Index calculates scores in these six specific domains as well as an overall score for sexual functioning.

Interpretation: There is a cut-off at 26.55, which means that all values below this cut-off are classified as indicating female sexual dysfunction.

The input was done with the Microsoft office 2019 software pack. Data recording and analysis were conducted with the SPSS (Statistical Package For Social Sciences) software version 22.0 and Épi Info 7.2.3 software. The charts were generated with the Microsoft Office Excel 2013 software. Quantitative variables were expressed as an average ± standard deviation and qualitative variables as numbers and percentages. Fisher's Exact Test was used to compare qualitative variables. A value of $p \leq 0.05$ was considered statistically significant.

All patients were assessed for depression using the Beck Depression Inventory-FastScreen (BDI FS). This is a short version of the BDI-II. The BDI-FS consists of 7 self-report items. The items are set up to assess mood status over the past two weeks on a 4-point Likert scale (0-3), giving a maximum total score of 21. The seven specific items on this measure include sadness, pessimism, feelings of failure in the past, loss of pleasure, low self-esteem, self-criticism and suicidal thoughts.

We performed hormonal dosages of LH, FSH, TSH, TESTOSTERONE, PROLACTIN and the analysis was carried out by the Niamey Radioisotope Institute (IRI).

Data were recorded and analyzed using SPSS (Statistical Package For Social Sciences) version 22.0 and EpiInfo 7.2.3. Graphs were generated using Microsoft Office Excel 2013.

Quantitative variables were expressed as mean ± standard deviation and qualitative variables as headcount and percentage. Fisher's exact test was used to compare qualitative variables. A p-value < or = 0.05 was considered statistically significant.

3. Results

During our study, 253 patients were on chronic hemodialysis. Among these, we collected data from100 cases through pre-dialysis interviews over a period of six months, from February 2023 to July 2023.

The majority of patients (77% or n = 77) were male with a sex ratio (M/F) = 3.35. The most represented age group was 30 to 45 years with 46% or n = 46. The average age was 43.71 ± 11.88 years with extremes ranging from 18 years to 75 years. The majority of patients (87% or n = 87) were married. More than half of the patients (67% or n = 67) had a personal medical history of high blood pressure.

Almost all patients (90% or n = 90) were administered two sessions of dialysis per week. The duration of the hemodialysis session was 4 hours in 99% of cases. Arteriovenous fistula was the vascular access used in 93% of cases. Chronic glomerulonephritis was the etiology found in 52% of cases or n = 52.

Functionally, libido disorder accounted for 87% of cases, 68% for sexual asthenia, 54% for orgasm disorder, 41% for ejaculation disorder, and 8% for menstrual disorder (Table 1).

According to the IIEF5, erectile dysfunction was severe in 28% of cases, moderate in 33%, and mild in 30%. According to the FSFI, 95.6% of patients had sexual dysfunction (Table 2).

Table 1. Distribution of patients according to clinical manifestations.

Clinical manifestations	Effective	%
Functional manifestations		
Libido disorder	87	87.00
Sexual asthenia	68	68.00
Orgasm disorder	54	54.00
Ejaculation disorder	41	41.00
Menstrual disorder	8	8.00
Sterility	2	2.00
Physical manifestations		
Reduction in pubic hair	15	15.00
Gynecomastia	8	8.00

Table 2. Patients distribution according to IIEF5 score interpretation.

IIEF5 Male Score	Effective	%
Severe erectile dysfunction	28	28.00
Moderate erectile dysfunction	33	33.00
Mild erectile dysfunction	30	30.00
Not interpretable	9	9.00
Total	**100**	**100.0**

Table 3. Distribution of patients according to the interpretation of the hormonal assessment.

Hormonal assessment	Effective	%
Hypogonadism in men	36	36.00
Hyperprolactinemia	34	34.00
Hypergonadotropic hypogonadism in men	11	11.00
Hypergonadotropic hypogonadism in men	5	5.00
Hypergonadism in men	1	1.00
Hyperthyroidism	1	1.00
Hypergonadism hypergonadotropic in men	1	1.00

Table 4. Distribution of patients according to hormonal assessments.

Other balance sheets	Sex	Effective	%
Testosterone	**Man** (ng/ml)		
	<3	36	36.00
	3 - 12	40	40.00
	>12	1	1.00
	Female (ng/ml)		
	0.07 - 0.65	23	23.00
FSH	**Man** (mUI/ml)		
	1 - 9	53	53.00
	>9	24	24.00
	Female (mUI/ml)		
	<2	3	3.00
	2 - 25	14	14.00
	>25	6	6.00
LH	**Man** (mUI/ml)		
	1 - 5	14	14.00
	>5	63	63.00
	Female (mUI/ml)		
	<2.5	2	2.00
	2.5 - 70	18	18.00
	>70	3	3.00
Prolactin	**Man** (ng/ml)		
	0 - 15	49	49.00
	>15	28	28.00
	Female (ng/ml)		
	0 - 20	17	17.00
	>20	6	6.00
Total	-	**100**	**100.0**

More than a quarter of male patients (36% or n = 36) had hypogonadism. (Table 3) Almost all patients (92% or n = 92) had a hemoglobin level below 11 g/dl.

More than half of the men had LH levels above 63%, n = 63. (Table 4)

In univariate logistic analysis, sexual dysfunction was significantly associated with age over 60 (p = 0.009), with male diabetic patients (p = 0.02), but also with anemic patients (p = 0.05).

Other explanatory variables such as testosterone level, prolactin level, TSH level and duration of dialysis were not associated with sexual dysfunction (p > 0.05).

In multivariate logistic analysis, explanatory variables such as depression, medication and hormonal disorders were significantly associated with the occurrence of sexual disorders (p < 0.05) (Table 5).

Table 5. Multivariate analysis between psycho hematotherapeutic factors and hormonal disorders.

psycho-hemato-thérapeutic Factors		Hormonal disorders		OR	ICOR	P	X^2
		Non N(%)	Yes N(%)				
Psychogenic factors							
Depression	mild	8 (19.05)	9 (15.52)	ND	ND	0.0104	11.2584
	Minimal	23 (54.76)	16 (27.59)				
	Moderate	5 (11.91)	20 (34.48)				
	Severe	6 (14.29)	13 (22.41)				
Hematological factor							
Anemia	No	0 (0)	5 (8.62)	ND	ND	0.0509	3.8113
	Yes	42 (100)	53 (91.38)				
Therapeutic factor							
Drug intake (thiadizine)	Non	3 (7.14)	0 (0)	ND	ND	0.0387	4.271
	Yes	39 (92.86)	58 (100)				
Total	-	**42 (100)**	**58 (100)**				

ND: Not defined.

4. Discussion

We reported a male predominance in 77% of cases. This male predominance had also been found in several African studies [8] [9] and [10]. These results are also confirmed by data from the literature according to which the progression of kidney diseases towards end-stage renal disease (ESRD) is much faster in men than in women [19].

The average age of our patients was 43.71 ± 11.88 years, and the age group from 30 to 45 years was the most represented with 46% of cases. The low life expectancy

in our developing countries could justify the relatively young age of our patients.

In this study, hypertension was the most represented cardiovascular risk factor with 67% of cases. Our results can be superimposed on those of Moussa T and colleagues in 2021 in Niger where hypertension was the most represented risk factor in 88.2% [20]. Our results are consistent with data from the literature, where hypertension is recognized as very frequently observed in chronic hemodialysis patients (73%) [21].

Furthermore, the majority of patients performed two hemodialysis sessions per week, i.e. 90% of cases. In 99% of cases, the duration of the sessions was 8 hours per week. Our results are different from those of Lobna Aribi1, Rim Masmoudi and colleagues in 2015 in Tunisia where 82% benefited from hemodialysis sessions 3 times per week [8]. The inadequacy of the infrastructure as well as the budget allocated to hemodialysis only allows two hemodialysis sessions per week for the majority of our patients, thus constituting a situation of underdialysis, a determining factor in the occurrence of sexual disorders.

In this study, chronic glomerulonephritis was the initial etiology present in more than half of the patients (52% of cases). These results are similar to those found by Diongolé *et al.* in 2023 in Niger where Glomerulopathies were the most frequent etiologies in 58.4% of cases [22]. This result is consistent with some data reported in the literature, where GNC is one of the main causes of CKD in adult patient cohorts, although the percentages vary depending on the regions and specificities of the populations studied. Another study conducted by Floege *et al.* [23] in Germany in 2019 underlined that GNC represents approximately 25% - 30% of the causes of CKD in Western countries, although some local factors, such as the prevalence of primary glomerulonephritis (e.g., IgA glomerulonephritis), may influence this statistics. The high prevalence of GNC in our study could be related to local epidemiological factors, including the high prevalence of infectious diseases that can cause chronic forms of glomerulonephritis.

Among our patients, libido disorder was observed in 87%, sexual asthenia was present in 68%, orgasm disorder in 54%, ejaculation disorder in 41%, menstrual disorder in 8%, and sterility in 2%. Furthermore, 8% of patients presented Gynecomastia while 15% of others eperienced a decrease in pubic hair. J. Avakoudjo A. Paré and colleagues in 2012 in Cotonou [24] reported a premature ejaculation in 34.1% of patients (15/44), decreased libido in 25% (11/44), and delayed ejaculation in 11.36% (5/44). Lobna Aribi1, Rim Masmoudi1 and colleagues in 2015 in Tunisia [8]. Also reported decreased libido (72.72%), decreased pleasure (60%), and anorgasmia (6.8%) among their subjects.

According to a multicenter study carried out in 2015 in Europe by P Stroumza and colleagues, 50.3% of women treated by hemodialysis presented sexual disorders [25]. These results highlight the clinical polymorphism of sexual disorders observed in chronic hemodialysis patients as has been mentioned in the literature.

Indeed, hormonal disorders lead to a disorder of desire. This is a deficiency of androgens, which are necessary for desire and erection. Androgens are well

known in men. They are common and significantly higher in uremic men. Diagnosis is based on testosterone levels. Arteritis, arteriosclerosis, heart disease, hypertension, and diabetes influence the vasodilation of smooth muscle fibers in the corpora cavernosa (in the penis), and erection will be difficult. Anemia, fatigue, acidosis, urea, calcium, and potassium disorders also negatively affect the erection/flaccidity sequence. More than half of people with chronic kidney failure experience sexual problems. This can range from a simple lack of interest in sexuality to a complete inability to achieve orgasm. This situation is experienced by many as an attack on their self-esteem. It can have a devastating effect and constitute an additional source of tension. We cannot therefore rule out a psychological cause added to hormonal, chemical, vascular causes but also and especially the underdialysis. All these factors can interfere with the accomplishment of a satisfactory sexual act in the dialysis patient.

Among our subjects, the average hemoglobin level was 8.9 g/dl, with extremes of 4.9 g/dl and 13.1 g/dl. These results are superimposable with those of Diallo D and colleagues in Mali in 2006 [26] who obtained an average of 8.56 g/dl and extremes of 5 to 15.1 g/dl. In fact, kidneys are responsible for the secretion of a hormone, EPO which stimulates the production of red blood cells by the bone marrow. In the case of chronic renal failure, there is a defect in the production of erythropoietin and an increase in tissue resistance to erythropoietin, hence the occurrence of anemia. The latter is responsible for fatigue and constitutes a significant factor in the appearance of sexual disorders. Hemodialysis is also accompanied by a chronic inflammatory state, which results in increased NO production, and may thus be the cause of so-called inflammatory-type anemia. Excess NO behaves like an intra-cytoplasmic iron deficiency, stimulating transferrin receptor biosynthesis and inhibiting ferritin and ALA synthase biosynthesis, resulting in anemia. The latter is responsible for fatigue and is a significant factor in the onset of sexual disorders [27].

In this study, according to the IIFE5 score, severe erectile dysfunction represents 28% of cases, 33% for moderate erectile dysfunction, and 30% for mild erectile dysfunction. Our results are different from those of Y. Kharbach and colleagues in 2016 [28] where severe erectile dysfunction was 6%, moderate erectile dysfunction 18%, and mild erectile dysfunction 23%. Mild to moderate dysfunction 30%; erectile function was normal in 23% of cases. I. Oueslatia and colleagues in Tunisia in 2017 [29] reported dysfunction as mild in 33.3% of cases, moderate in 23.3%, and severe in 20%. Babacar DIAO and colleagues found in 2017 in Dakar [30] that the overall prevalence of ED was 26% (14.4% mild ED, 8.5% moderate ED, and 3.1% severe ED).

Furthermore, according to the FSFI score in women, 95.6% of patients presented sexual disorders. Our results are superimposable with those of Y. Kharbach and colleagues in Morocco in 2016 [28], for whom 84% of women presented sexual disorders. In our study, men who presented severe sexual disorders were 22, among whom 7 were over 60 years old; the same is true for those who presented

moderate sexual disorders, 26 of whom 1 was over 60 years old.

However, no significant statistical correlation was observed in female patients.

Elhadj Fary Ka and colleagues in Dakar in 2014 [31] found in men a significant correlation between the occurrence of sexual disorders and age ($p = 0.04$).

We observed a correlation between male hypertensive patients and the occurrence of mild sexual disorders. For Lobna Aribi1, Rim Masmoudi and colleagues in 2015 in Tunisia [8] only three factors concerning nephropathy were positively correlated with the alteration of sexuality: a duration of evolution greater than 5 years ($p = 0.007$), a hemodialysis delay greater than or equal to 1 year and a half ($p = 0.04$), and a diabetic and hypertensive origin of nephropathy ($p = 0.004$). These positive correlations have also been reported in the literature.

In our study, the correlation between sexual disorders and diabetes was observed in male patients with severe and moderate disorders, respectively $p = 0.02$ and $p = 0.04$. Indeed, arterial hypertension, diabetes, the heavy therapy associated to them, as well as hyperlipidemia, phosphocalcic disorders and uremia are recognized, not only as atherosclerotic factors responsible for penile vascular insufficiency, but also as direct toxic agents of the cavernous tissue through oxidative stress [32] [33].

Moreover, a positive statistical link was observed between sexual disorders and anemia in male patients with severe sexual disorders ($p = 0.05$). According to Y. Kharbach and colleagues in Morocco in 2016 [28], anemia was significantly linked to the occurrence of sexual disorders ($p = 0.031$).

This can be explained by the fact that anemia is a factor commonly encountered in chronic renal failure and is a factor linked to the occurrence of sexual disorders. Hypoxemia associated with anemia leads, on the one hand, to functional asthenia, and, on the other hand, it damages the cavernous smooth muscle [32].

5. Conclusion

In Niger, sexual dysfunction among chronic hemodialysis patients is common and has multifactorial etiologies. These sexual dysfunctions are related to age, gender, hypertension, diabetes, and anemia. They should be considered as major factors affecting patients' quality of life. Their management should be integrated into therapeutic strategies and clinical, biological, and hormonal monitoring.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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