

Erectile Dysfunction in Chronic Hemodialysis Patients at the University Hospital Center of Point-G in Mali

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Abstract

Introduction: Erectile Dysfunction (ED) is defined as the inability to achieve or maintain an erection sufficient for sexual intercourse. The frequency of erectile dysfunction in patients with kidney failure is estimated at 50% to 70%. The objective of this work was to determine the frequency of sexual dysfunction in chronic hemodialysis patients, to evaluate the psycho-social impact and to describe hormonal disturbances. **Patients and Methods:** This was a descriptive prospective study carried out from 3 April to 31 August 2017 in the nephrology and haemodialysis department of the Point G University Hospital. She has been interested in men over the age of 18 who have been on chronic hemodialysis for more than a year. Sexual dysfunction was assessed using the questionnaire: International Index of Erectile Function (IIEF-5). **Results:** Sixty-five patients were included. Forty-six (70.8%) had severe (30.8%), moderate (13.8%) and mild (26.2%) ED. 56.9% of patients had libido disorders, with decreased sexual desire (38.5%); absent sexual desire (18.5%). Sexual desire was normal in 43.1% of patients. Sexual activity was absent in 20 patients (30.8%). Sexual rigidity was reduced in 28 patients (43.1%) and normal in 24 patients (36.9%). The mean age of our patients was 42.55 years with a median age of 40 years and extremes of 23 and 74 years. Eighty percent were married. Nine patients (13.8%) were using sildenafil-based medications. Antihypertensives were prescribed in 93.9% and erythropoietin in 30.8% of patients. The main impact groups were anxiety (53.8%),

fear of failure (27.7%), insomnia (7.7%) and anxiety (6.1%). And defence mechanisms included: understanding (54.7%); isolation (24.6%); repression (7.7%); quarrel (7.7%); and divorce in 1 case (1.5%). The occurrence of ED was related to hypotestosterolemia ($p = 0.030$), and between low libido and testosterone ($p = 0.001$). Nutritional status was satisfactory in 78.4% of our patients. Moderate and at and severe undernutrition was found in equal proportions (10.8%) in our patients with a statistically significant relationship with the occurrence of erectile dysfunction ($p = 0.015$). There was no correlation between ED and duration of dialysis ($p = 0.715$), the existence of inflammatory syndrome ($p = 0.870$), age ($p = 0.249$) and diabetes, hypertension, smoking ($p = 0.442$). Sexual activity was decreased in 41 patients with Hb < 10 g/dl ($p = 0.340$). **Conclusion:** Sexual disorders are common in hemodialysis patients. Psychological support of the patient is essential throughout the therapeutic sequence of erectile dysfunction, whatever the molecule or physical means considered.

Keywords

Erectile Dysfunction, Renal Failure, Dialysis, Mali

1. Introduction

Erectile dysfunction (ED) is defined as the inability to achieve or maintain an erection sufficient for sexual intercourse [1].

Erectile dysfunction is a common condition in the general population. The frequency of these erectile dysfunctions is increased in certain special populations such as patients with renal insufficiency, where it is estimated at 50% to 70% depending on the stage of renal failure [2]. In this population even more than in the general population, ED appears to be of multiple etiologies, combining organic and psychological disorders [2].

While kidney transplantation is the treatment of choice for end-stage renal disease, it appears to have widely varying effects on ED. Indeed, it can improve the ED as well as the overall quality of life.

The incidence of ED in this specific population is not easy to assess as it is still a taboo subject. However, some epidemiological studies show that it may affect more than 50% of dialysis or transplant patients, with the extent of ED directly correlated with disease severity [3].

In Benin the frequency of erectile dysfunction was 75.9%, of which 29.3% were severe erectile dysfunction [4].

In 2013, a study conducted in Senegal found that 57% of the patients included had mild to moderate ED [5].

At first glance, sexual problems are often considered secondary in these patients. However, taking them into account in the overall management of these patients contributes greatly to improving their quality of life. In the last ten years, significant progress has been made in the management of ED in patients

with chronic renal failure and transplantation, particularly since the development of phosphodiesterase type 5 inhibitors [3].

The objective of this work was to determine the frequency of sexual dysfunction in chronic hemodialysis patients, to evaluate the psycho-social impact and to describe hormonal disturbances.

2. Patients and Methods

This was a descriptive prospective study carried out from April 3 to August 31, 2017 in the nephrology and hemodialysis department of the CHU du Point G. She has been interested in male patients over the age of 18 who have been on chronic hemodialysis for more than a year. Not included were hemodialysis patients with:

- Acute renal failure
- Uncontrolled diabetes,
- Uncontrolled heart disease
- Refusal to participate in the study,
- Acute complication during hospitalization.

Sexual dysfunction was assessed using the International Index of Erectile Function (IIEF-5) questionnaires. It consists of five main sections, each with five questions rated from 1 to 5 that explore the quality of sexual intercourse, sexual desire and overall satisfaction with sexual intercourse. For interpretation, a score has been established; thus, erectile dysfunction is defined as severe (score 5 - 10), moderate (11 - 15), mild (score 16 - 20), absent (score 21 - 25). Erectile strength was defined as: normal rigidity, reduced rigidity but allowing penetrative sex, reduced rigidity not allowing penetrative sex, and no erection. All patients were given a full clinical examination. The data are collected on a pre-established anonymous survey form. The parameters studied were:

- socio-demographic: age, marital status, occupation,
- co-morbidities: diabetes, hypertension, smoking,
- etiological factors,
- number of years spent on haemodialysis,
- type of causal kidney disease.
- Sexual activity: absence of sexual activity, at least once/week, at least once/15 days, at least once/month and less than once/month.
- residual diuresis: 24-hour urine volume greater than or equal to 500 ml.
- Biological: testosterone, haemoglobin level, blood sugar, blood calcium, phosphorus, parathormone, albumin, CRP.
- The psycho-social impact:
 - *Large groups of psychic repercussions: anxiety, anguish, fear of failure, insomnia.
 - *Mechanical defense reactions: understanding, repression, isolation, argument, divorce.
- Treatment in progress: antihypertensive, erythropoiesis-stimulating agents

and other drugs. All participating patients signed free and informed consent after a broad explanation of the purpose of the study.

Data entry was performed with Word 2010 software, with statistical analysis performed by SPSS version 18 software. The Statistical Comparison Test was Chi-square with a value of $p < 0.05$ considered statistically significant.

3. Results

Sixty-five patients met the inclusion criteria. Forty-six patients or 70.8% had erectile dysfunction (ED); defined as severe (30.8%), moderate (13.8%) and mild (26.2%). Libido disorders were present in 56.9% of patients, with decreased sexual desire (38.5%); absent sexual desire (18.5%). Sexual desire was normal in 43.1% of patients. Sexual activity was absent in 20 patients (30.8%). Sexual rigidity was reduced in 28 patients (43.1%) and normal in 24 patients (36.9%). The mean age of our patients was 42.55 years with a median age of 40 years and extremes of 23 and 74 years. Fifty-two point three percent (52.3%) were between the ages of 18 and 40. ED was common (70.58%) in patients 18 to 40 years of age but not significant ($p = 0.241$) (c.f **Table 1**).

Civil servants and traders accounted for 30.8 and 30.8 per cent respectively. Bride and groom accounted for 80% of patients. The co-morbidities were: hypertension (56.9%), diabetes (9.3%), tobacco (6.2%). Initial nephropathy was vascular in 50.8% of cases. Patients with less than 3 years of dialysis were the most affected by a lack of sexual activity at 13.84%, which was statistically insignificant ($p = 0.715$). The average length of time on dialysis was 4.38 years. Residual diuresis was found in 12.3% of cases. Patients with diuresis had no erectile dysfunction in 75% (6/8) of cases ($p = 0.024$) (c.f **Table 2**).

A hemoglobin level < 10 g/dL was found in 78.5% of cases. The average Hb level was 8.56 g/dL. HPR was increased in 40% of cases. Testosterone levels were normal in 83.1% of cases, low in 12.3% and high in 4.6% of cases. Albumin levels above 38 g/l were found in 78.6% of cases and below 35 g/l in 10.8%. A normal parathormone was observed in 64.8% of cases and elevated (above 585 ng/ml) in 13 patients or 24.1%. The phospho-calcium product was normal (Normal < 4.4 mmol²/L) in 76.9% of cases. The main impact groups were anxiety (53.8%), fear of failure (27.7%), insomnia (7.7%) and anxiety (6.1%). And defence mechanisms

Table 1. Distribution of patients by age and erectile dysfunction.

Age	Dysfunction erectile				Total
	severe TE	moderate ET	Light TE	normal OT	
18 - 40	9	4	11	10	34 (52.3%)
41 - 60	6	4	6	9	25 (38.5%)
Above 60	5	1	0	0	6 (9.2%)
Total	20 (30.8%)	9 (13.8%)	17 (26.2%)	19 (29.2%)	65 (100%)

TE: erectile dysfunction; Erectile dysfunction was common in patients aged 18 to 40 years, 70.58% (24/34) of cases with $p = 0.241$. (Chi 2 = 18.41; ddl: 15).

included: understanding (54.7%); isolation (24.6%); repression (7.7%); quarrel (7.7%); and divorce in 1 case (1.5%).

The occurrence of ED was related to hypotestosteronaemia ($p = 0.030$), and between low libido and testosterone ($p = 0.001$) (c.f **Table 3** and **Table 4**). Nutritional status was satisfactory in 78.4% of our patients. Moderate and in and severe undernutrition was found in equal proportions (10.8%) in our patients with a statistically significant relationship with the occurrence of erectile dysfunction ($p = 0.015$) (c.f **Table 5**). There was no correlation between ED and duration of dialysis ($p = 0.715$), the existence of inflammatory syndrome ($p = 0.870$), age ($p = 0.249$) and diabetes, hypertension, smoking ($p = 0.442$). Sexual activity was

Table 2. Distribution of patients by diuresis and erectile dysfunction.

Dysfunction erectile	Diuresis		Total
	No	Yes	
Severe	19	1	20 (30.8%)
Moderate	9	0	9 (13.8%)
Light	16	1	17 (26.2%)
Normal	13	6	19 (29.2%)
Total	57 (87.7%)	8 (12.3%)	65 (100%)

Patients with diuresis had no erectile dysfunction in 75% (6/8) of cases with $p = 0.024$. (Chi 2: 9.44; ddl: 3).

Table 3. Distribution of patients according to testosterone and erectile dysfunction.

Dysfunction erectile	Testosterone			Total
	Bass	Normal	High	
Severe	6	13	1	20 (30.8%)
Moderate	2	6	1	9 (13.8%)
Light	0	16	1	17 (26.2%)
Normal	0	19	0	19 (29.2%)
Total	8 (12.3%)	54 (83.1%)	3 (4.6%)	65 (100%)

Erectile dysfunction was associated with hypotestosteronaemia in 8 patients or 12.30% of cases with $p = 0.030$. (Chi 2: 13.98; ddl: 6).

Table 4. Distribution of patients according to testosterone and libido disorders.

Libido	Testosteronemia			Total
	Bass	Normal	High	
Normal	0	28	0	28 (43%)
diminished	3	19	3	25 (38.5%)
Absent	5	7	0	12 (18.5%)
Total	8 (12.3%)	54 (83.1%)	3 (4.6%)	65 (100%)

There was a libido disorder in all patients with low testosterone, 12.30% of cases with $p = 0.001$. (khi 2: 18.65, ddl: 4).

Table 5. Distribution of patients by nutritional status and erectile dysfunction.

Dysfunction erectile	Albuminemia			Total
	Sup at 38	35 - 37.5	inf to 35	
Severe	10	4	6	20 (30.8%)
Moderate	8	1	0	9 (13.8%)
Light	15	1	1	17 (26.2%)
Normal	18	1	0	19 (29.2%)
Total	51(78.4%)	7 (10.8%)	7 (10.8%)	65 (100%)

Erectile dysfunction was associated with severe undernutrition in 7 patients or 10.8% of cases with $p = 0.015$. (Chi 2: 15.79, ddl: 6).

decreased in 41 patients with Hb < 10 g/dl but not statistically significant ($p = 0.340$). Antihypertensive therapy was prescribed in 93.9% of patients. Epo was prescribed in 30.8% of patients. Nine patients or 13.8% were using medication containing sildenafil and 86.2% were abstaining.

4. Discussion

The high cost of additional tests, non-consent and the low level of patient education limited our study.

It has been shown that sexual dysfunction is frequently encountered in patients with CKD in the hemodialysis stage [6] [7]. These patients are exposed to a certain number of co-morbidities (hypertension, diabetes, depression, etc.) which increase the frequency of these disorders compared to the general population.

In our study, the prevalence of ED was 70.8%. It was moderate (13.8%), severe (30.8%), mild (26.2%). In the study by Avakoudjou *et al.* [4], ED was present in 75.9% of hemodialysis patients and was severe in 29.3%, moderate and mild in 20.7% and 25.8%, respectively. Kharbach *et al.* found a frequency of ED in 78% of patients, with mild in 23%, mild to moderate in 30%, moderate in 18%, and severe in 6% of cases [8].

The average age of our patients was 42.55 years with a median age of 40 years and extremes of 23 and 74 years. Kharbach *et al.* had returned to an average age of 45.5 years and extremes of 18 and 75 years [8]. On the other hand, the population appears older in the Leonardo EM study [9] which reported a mean age of 50.2 years \pm 14 years. The most represented age group was between 18 and 40 years old, or 52.3% in our study. In the literature [10] [11], the prevalence of erectile dysfunction increased with patient age ranging from 69% for patients aged 20 - 50 years to 78% for patients over 50 years. There was no statistically significant relationship between age and the occurrence of erectile dysfunction in our series ($p = 0.241$). Civil servants and shopkeepers were the most identified socio-professional groups with 30.8% for each, which can be explained by the high financial cost of chronic dialysis.

Married people accounted for 80% and single people for 20% of patients, which may be explained by the fact that men marry early for religious and cul-

tural reasons.

The most common co-morbidities were hypertension in 56.9% and diabetes in 9.3% of patients. In contrast, Avakoudjo in Benin [4] recovered from hypertension (87.9%) and diabetes (12.1%). There was no significant association between diabetes, hypertension, smoking and the occurrence of sexual dysfunction in our patients ($p = 0.442$).

Vascular pathologies are risk factors for the elderly, especially because of the associated endothelial dysfunction. The latter would be largely responsible for the ED. Vascular nephropathy was the most common etiology at 50.8% of cases, followed by chronic glomerulonephritis (24.6%) and in 13.8% of cases no underlying etiology was found. There was no statistically significant correlation between ED and initial nephropathy ($p = 0.419$).

The average age on hemodialysis was 4.38 years for extremes of 12 months and 16 years. In our series there was no relationship between the length of time on dialysis and the occurrence of the disorder. This is in line with several studies [11] [12]. Diuresis was maintained in 8 patients or 12.30% of cases. We found the absence of erectile dysfunction in 75% of cases in these patients compared to oligoanuric patients, so the absence of diuresis was significantly related to the occurrence of sexual dysfunction with $p < 0.024$. Anemia was found in the majority of our patients, with hemoglobin levels < 10 g/dl in 78.46% of cases and a mean of 8.56 g/dl with extremes of 5 and 15.1 g/dl. This is a factor usually seen in patients with chronic renal failure but was not related to the occurrence of sexual dysfunction ($p = 0.249$). Malekmakam [11] and Naya [12] found no significant relationship between anaemia and ED. In our series, nutritional status was satisfactory in 78.4% of our patients. Moderate and at and severe undernutrition was found in equal proportions (10.8%) in our patients with a statistically significant relationship with the occurrence of erectile dysfunction ($p = 0.015$). Endocrine and metabolic disturbances are numerous and affect the quality of erection. [13]. Hyperparathyroidism was noted in 24.1% of cases with a PTH level greater than 9 times the upper norm, but no correlation between sexual disorders and hyperparathyroidism was found ($p = 0.286$). Numerous studies have reported a decrease in testosterone in hemodialysis patients with erectile dysfunction, libido and orgasm [14] [15]. In our study, testosterone was normal in 83.1% of cases and significantly lower in patients with sexual dysfunction with ($p = 0.030$). Impaired libido was observed in 57% of our patients and significantly related to decreased testosterone levels ($p = 0.001$). Penile rigidity was reduced but allowed sexual intercourse in 25 patients or 38.5% and was normal in 24 patients or 36.9%.

We found that 69.2% of our patients were sexually active as follows: 12 patients had sex at least once a week (18.5%), 14 patients had sex at least once every 15 days (21.5%), 16 patients had sex at least once a month (24.6%) and 3 patients had less than once a month (4.6%). The use of sexual stimulants based on Sildenafil after medical consultation or self-medication on the advice of friends was observed in 9 patients, *i.e.* 13.8%. Two patients had noted a slight

improvement after this treatment, *i.e.* 22.2%. In other studies of ED in hemodialysis patients, care utilization ranged from 1 to 9.6% [16] [17]. Even if ED is becoming a real topic of discussion, it remains a taboo subject for many men and sometimes even for the medical profession [18]. The main groups of effects were psychic: Anxiety (53.8%); fear of failure (27.7%); Insomnia (7.7%) and anxiety (6.1%). On the other hand, in Dakar CISSE [5] had regained anxiety (24%); fear of failure (22.5%); anxiety (1.5%); insomnia (16%). Depression, anxiety and depression syndrome, and loss of self-esteem are all complementary factors, frequent in these patients, that play a role in the genesis of ED [19]. Mechanical defence reactions were marked by understanding in (54.7%); isolation (24.6%); repression (7.7%); quarrel (7.7%); divorce (1.5%). In our series, taking antihypertensive medication was not associated with any sexual dysfunction. Antihypertensive therapy was prescribed in 93.9% of patients and EPO-stimulating agents in 35.4%.

5. Conclusion

Sexual disorders are common in hemodialysis patients. Psychological support of the patient is essential throughout the therapeutic sequence of erectile dysfunction, whatever the molecule or physical means considered.

Conflicts of Interest

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

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Hemodialysis Patient Tracking Sheet

Questionnaire No.....

Q1. Identification:

Name:.....

First names:.....

Age: (year).....

Age range /_____/ 1 = 20 - 30; 2 = 31 - 40; 3 = 41 - 50; 4 = 51 - 60; 5 = 61 - 70; 6 ≥ 70;

Occupation /_____/ 1 = civil servant; 2 = shopkeeper; 3 = student/student;
4 = worker; 5 = retired; 6 = others

Residence: /_____/ 1 = Bamako, 2 = Outside Bamako, 3 = Sub-region

Married: / / Single: / /

Q2. Etiological factors:

Alcohol: 1 = Yes 2 = No, Tobacco: 1 = Yes 2 = No

Q3. Type of causal nephropathy:

1 = CNG; 2 = Diabetic; 3 = Vascular; 4 = NIC; 5 = PKR; 6 = Other

Q4. Duration in hemodialysis: /_____/ years

1 ≤ 5 years; 2 = 5 - 10 years; 3 = 10 years - 15 years; 4 ≥ 15 years

Q5. Residual diuresis:CC/24h

Q6 Erectile dysfunction:

1 = Before dialysis; 2 ≤ 5 years on dialysis; 3 ≥ 5 years on dialysis; 4 = Other

Q7. Further examinations

BIOLOGY

- Hopper value /_____/

Calcium balance Value /_____/; calcium /_____/

1 = hypocalcemia; 2 = hypercalcemia; 3 = normal calcium; 4 = Hyperphosphatemia; _____

Phosphoremia 1 = hypo phosphoremia /_____/ 2 = normal phosphoremia /_____/; 3 = Hyperphosphatemia /_____/

VitD3 Value /_____/; 1 = Low; 2 = Normal; 3 = High

PTH: Value /_____/; 1 = Low; 2 = Normal; 3 = Very High > X 9 normal value;
4 = High < X 9 normal value

- CBC count:

Hemoglobin level /_____/ 1 = 3 - 6; 2 = 6-9; 3 = 9 - 12

Anemia /_____/; 1 = normo-chromium normocytic; 2 = microcytic hypochromatic;
3 = normocytic hypochromatic

CRP: 1 = Normal; 2 = High

Testosteronimiy:/ /; 1 = Normal; 2 = High; 3 = Low

Albuminemia: 1 = Normal; 2 = Low

Questionnaire IIEF-5: Assessment of sexual potency

Q8. How sure were you that you could get an erection and maintain it?

1. Not sure at all. 2. Not very sure. 3. Moderately safe
4. Sure 5. Very safe

Q9. When you have had erections as a result of sexual stimulation, how often has your penis been stiff enough (hard) to allow penetration?

0. I have not been sexually stimulated
1. Almost never or never
2. Rarely (much less than half the time)
3. Sometimes (about half the time)
4. Most of the time (much more than half the time)
5. Almost all the time or all the time

Q10. When you tried to have sex, how often were you able to stay erect after penetrating your partner?

0. I didn't try to have sex.
1. Almost never or never
2. Rarely (much less than half the time)
3. Sometimes (about half the time)
4. Most of the time (much more than half the time)
5. Almost all the time or all the time

Q11. During sex, how difficult was it for you to keep an erection until you had sex?

0. I didn't try to have sex.
1. Extremely difficult
2. Very difficult
3. Difficult
4. A little difficult.
5. Not difficult.

Q12. When you tried to have sex, how often were you satisfied?

0. I didn't try to have sex.
1. Almost never or never
2. Rarely (much less than half the time)
3. Sometimes (about half the time)
4. Most of the time (much more than half the time)
5. Almost all the time or all the time

Q13. Do you want to have sex? O yes O no

Q14. Do you have sexual intercourse? O yes O no

Q15. Do you have erections? O Yes, with normal rigidity.

O Yes, with reduced rigidity, but allowing penetrative sex.

- Yes, with reduced rigidity, not allowing penetrative sex
- No, no erection.

Q16. Do you take medication to promote erections? yes no

Q17. If yes, which one(s)?

- Viagra Cialis Levitra Edex Caverject other

Q18. Sexual activity:

- 1: No sexualactivity 2: At least once a week 3: At least once per 15 days
- 4: At least once per month 5: Less than once per month

Q19. The psychosocial impact:

- The major groups of psychic repercussions

- Anxiety: 1 = Yes 2 = No Fear of failure: 1 = Yes 2 = No;
- Anxiety: 1 = Yes 2 = No; Insomnia: 1 = Yes 2 = No and

- Mechanical defence reactions

- Comprehension: 1 = Yes 2 = No; Isolation: 1 = Yes 2 = No
- Refusal: 1 = Yes 2 = No; Dispute: 1 = Yes 2 = No ;
- Divorce: 1 = Yes 2 = No.