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Frequency and Associated Factors of Erectile Dysfunction among Patients with Liver Cirrhosis in Parakou, Republic of Benin in 2022

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Abstract

Introduction: Erectile dysfunction is a pathology less expressed by patients, but it affects their quality of life. The objective of this work is to study erectile dysfunction among patients with cirrhosis in Parakou in 2022. **Patients and Methods:** This was a descriptive and analytical cross-sectional study with prospective data collection, conducted from February 1 to June 30, 2022 at the Teaching Hospital of Borgou/Alibori and the Military Teaching Hospital of Parakou. Men with liver cirrhosis who gave their informed verbal consent were included. Erectile dysfunction was diagnosed using IIEF-5 score. The prognosis of cirrhosis was assessed using Child-Pugh score. The data were analyzed by Epi Data analysis 2.3 software. **Results:** A total of 64 patients were included. Their mean age was 43.53 ± 13.13 years. Cirrhosis was secondary to chronic hepatitis B virus infection in 55 patients (85.94%). In this study, 42 patients (65.63%) had at least one decompensation of cirrhosis. Among the 64 patients included, 27 (42.18%) had erectile dysfunction. This erectile dysfunction was moderate in 12 patients (44.44%). The other sexual disorders found in these patients were decreased libido and ejaculation disorders. After multivariate analysis, the factors statistically associated with erectile dysfunction were: age ($p < 0.001$), alcoholism ($p = 0.005$), hepatocellular carcinoma ($p = 0.014$) and Child-Pugh C score ($p = 0.046$). **Conclusion:** Erectile dysfunction is common in patients with liver cirrhosis. It is more frequent when the cirrhosis is complicated and the patients are elderly. Nevertheless, it should be systematically sought in any patient with liver cirrhosis.

Keywords

Erectile Dysfunction, Cirrhosis, Associated Factors, Parakou

1. Introduction

Erectile dysfunction (ED) is defined as the inability to achieve or maintain a penile erection sufficient for full sexual intercourse [1]. It is one of the most common chronic diseases in men and its prevalence increases with age [2]. ED shares common risk factors with cardiovascular disease (lack of physical exercise, obesity, smoking, high cholesterol level and metabolic syndrome). Some factors are modifiable [3]. ED can be organic, psychogenic and mixed [1]. In the past, most cases of ED were considered to be of psychological origin, but nowadays organic causes are found in at least 80% of cases [4]. The causes of ED are variable and can include arterial, neurogenic, hormonal, cavernosal, iatrogenic and psychogenic disorders [2].

End-stage liver disease (cirrhosis) is known to cause hormonal dysregulation in both men and women [5]. The pathogenesis of ED in patients with chronic liver disease remains multifactorial and poorly understood. Hypogonadism is secondary to a reduction in the synthetic function of the liver. Impaired hormone production, malnutrition, depression, consumption of alcohol and some medications can all contribute to the development of ED in this population [6]. ED is often under-diagnosed in this category of patients. Few data are available on ED in patients with chronic liver disease at the stage of cirrhosis [7]. The available studies were conducted in patients suffering from decompensated cirrhosis or awaiting a liver transplantation or suffering from alcoholic cirrhosis [8]. The severity of liver cirrhosis has been shown to correlate with the severity of ED [1]. It is under-diagnosed given its taboo character, especially in our context.

The prevalence of ED in the general population varies between 5% and 50% [9]. Recent studies show that the prevalence of ED in patients with liver cirrhosis is approximately 50% [7]. In Africa, few studies are available on ED among patients with liver cirrhosis. In Benin Republic, few studies have evaluated the frequency and factors associated with ED in patients with chronic liver disease, which explains the present study. The objective of this work is to study erectile dysfunction among subjects with cirrhosis in Parakou in 2022.

2. Patients and Methods

2.1. Type and Period of Study

This was a descriptive and analytical cross-sectional study with prospective data collection, conducted from February 1 to June 30, 2022.

2.2. Study Sites

The study took place in the internal medicine department of the Regional Teaching Hospital of Borgou-Alibori (CHUD-B/A) and in the hepato-gastroenterology unit of the Military Teaching Hospital (HIA-CHU) in Parakou.

2.3. Study Population

It consisted of patients with liver cirrhosis followed up in the internal medicine de-

partment of CHUD/B-A and in the hepato-gastroenterology unit of HIA-CHU.

2.4. Inclusion Criteria

Any man with cirrhosis regardless of the cause and having given his informed verbal consent was included.

2.5. Exclusion Criteria

Any man with cirrhosis who had not performed a minimum biological tests allowing calculation of the Child Pugh score and/or any subject with ED before the diagnosis of cirrhosis was excluded. Comatose patients were also excluded.

2.6. Judgment Criteria

- **Diagnosis of cirrhosis**

The positive diagnosis of cirrhosis was non-invasive, based on a range of clinical, biological and morphological arguments, namely:

- Signs of portal hypertension (abdominal collateral circulation, splenomegaly, thrombocytopenia, portal vein dilatation, recanalized umbilical vein).
- Signs of liver failure (gynecomastia, palmar erythema, Terry's nails, drop in prothrombin time, hypoalbuminemia).
- Changes in the hepatic appearance (hard and painless hepatomegaly with a firm lower edge, a granular anterior surface, atrophy, dysmorphia, heterogeneous appearance with irregular contours on ultrasound).
- Aspartate aminotransferase to Platelet Ratio Index (APRI) score ≥ 2.

In terms of etiological diagnosis, cirrhosis was caused by hepatitis B when the HBs antigen was positive. The hepatitis C virus was incriminated when the anti-HCV antibody was positive and the HCV RNA was detectable. When the auto-antibodies were detected, the diagnosis of autoimmune cirrhosis was made. Cirrhosis was assumed to be of alcoholic origin when: 1) the subject consumed more than 30 grams of alcohol per day; 2) there were clinical and biological signs of alcoholic consumption; 3) hepatitis B and C serologies were negative.

- **Evaluation of the prognosis of cirrhosis**

Child-Pugh score was used. It is based on 5 parameters: bilirubin, albumin, prothrombin time (PT), ascites and encephalopathy.

- **Diagnosis and assessment of ED severity**

The International Index of Erectile Function-5 (IIEF-5) was used. This is a validated score, aimed at determining the presence of ED severity in men [10]. This questionnaire assesses sexual function over the past 6 months.

2.7. Sampling

- **Sample size**

The size of our sample corresponded to the number of patients with liver cirrhosis seen in consultation or hospitalization in the two hospitals during the study period.

- **Sampling technique**

All patients with cirrhosis seen in consultation or in hospital who met the inclusion criteria were recruited.

2.8. Data Collection

- **Data collection technique and tool**

The tool used to collect the information was a questionnaire. The information was collected during a semi-structured individual interview. A part of the questionnaire was designed by the initiators of this study. Some standard and recognized scores have been added. It includes 21 questions grouped into 5 items. It has been pre-tested before the start of the study. The questionnaire is appended.

- **Method of data collection**

Patient recruitment was done daily. After obtaining their informed verbal consent, the patients selected for the survey were interviewed through a semi-structured interview. The information related to the paraclinical tests was completed on the survey form as soon as the results were available.

2.9. Study Variables

The dependent variable was the existence of an ED. The independent variables were: sociodemographic, socioeconomic, toxic history and habits, diagnosis of cirrhosis, stage of cirrhosis and diagnosis of ED.

2.10. Data Analysis

Data were analyzed with Odense Denmark (2009) and Epi Data analysis 2.3 software from Epi Data Association. Qualitative variables were described using sizes and percentages. The quantitative variables were expressed as mean ± standard deviation when the distribution is normal, otherwise as medians [1st interquartile-3rd interquartile]. Data comparison was made using Pearson's chi-square test or Fisher's exact test as appropriate. The significance threshold was set at 5%.

2.11. Ethical Consideration

Before carrying out this study, the protocol was submitted to the Local Ethics Committee for Biomedical Research of the University of Parakou (CLERB-UP) for approval. This study was conducted with the informed verbal consent of the patients. Medical secrecy and patient rights were respected throughout the study. Patients were reassured about the anonymity and confidentiality of the information collected. Patients with erectile dysfunction were referred for urological consultation and follow-up.

3. Results

3.1. Study Population

During the study period, 103 subjects with cirrhosis were consulted and/or hos-

pitalized in the internal medicine department of CHUD-B/A (n = 88) and the hepato-gastroenterology unit of HIA-CHU of Parakou (n = 15). Among these 103 patients, 64 were men (CHUD-B/A n = 51 and HIA-CHU n = 15) and the subject of the present study.

3.2. Sociodemographic Data of the Study Population

The mean age of the subjects included in this study was 43.53 ± 13.13 years with the extremes of 22 and 75 years. Thirty-eight (38 or 59.38%) came from rural areas and half of them (32% or 50%) were farmers. Twenty subjects (31.25%) had an excessive alcohol consumption and 8 (12.50%) were smokers. Among the subjects included in the study, 5 (7.81%) suffered from high blood pressure and 4 (6.25%) from diabetes. Table 1 summarizes the sociodemographic data of

Table 1. Distribution of men with cirrhosis according to socio-demographic data (CHUD-B/A, HIA-CHU, Parakou, 2022, n = 64).

	Size	Percentage (%)
Age (years)		
<30	07	10.94
[30 - 39[	20	31.25
[40 - 49[	15	23.44
[50 - 59[	14	21.87
≥60	08	12.50
Place of residence		
Rural area	38	59.38
Urban area	26	40.62
Socio-professional status		
Farmers	32	50.00
Employees (public or private)	14	21.88
Artisans/Laborers	07	10.94
Traders	04	06.25
Breeders	03	04.69
Pupils/Students	02	03.13
Unemployment	02	03.13
Toxic habits		
Excessive consumption of alcohol	20	31.25
Smoking	08	12.50
Medical health history and comorbidities		
High blood pressure	05	07.81
Diabetes	04	06.25

patients included in this study.

3.3. Cirrhosis Data

Cirrhosis was secondary to chronic hepatitis B virus infection in 55 patients (85.94%). In this study, 42 patients (65.63%) with cirrhosis had both edema and ascites as decompensation. 42 of them (65.63%) had hepatocellular carcinoma. Regarding the prognosis, 31 patients (48.44%) were in Child-Pugh class B. Table 2 shows the data relating to cirrhosis.

3.4. Erectile Dysfunction Data

ED was found in 27 patients with cirrhosis out of the 64 patients included, representing a frequency of 42.19%. Among the 27 patients with cirrhosis and ED, 12 (44.44%) had moderate erectile dysfunction. The other sexual disorders found in patients were a decrease in libido and ejaculation disorders. Table 3 summarizes the ED data.

Factors associated with erectile dysfunction

In this study, in bivariate analysis, the factors statistically associated with ED were:

Table 2. Distribution of men with cirrhosis according to cirrhosis data (CHUD-B/A, HIA-CHU, Parakou, 2022, n = 64).

	Size	Percentage (%)
Cause of cirrhosis*		
Hepatitis B virus infection	55	85.94
Excessive consumption of alcohol	13	20.31
Hepatitis C virus infection	03	04.69
Autoimmune hepatitis	01	01.56
Decompensation**		
Ascites	42	65.63
Hepatocellular carcinoma	42	65.63
Acute renal failure	11	17.19
Gastro-intestinal bleeding	08	12.50
Hepatic encephalopathy	03	04.69
Hydrothorax	03	04.69
Child-Pugh score		
Class A	07	10.94
Class B	31	48.43
Class C	26	40.63

*A patient can have several causes at the same time; **A patient can have several decompensations at the same time.

Table 3. Distribution of men with cirrhosis according to erectile dysfunction data (CHUD-B/A, HIA-CHU, Parakou, 2022, n = 64).

	Size	Percentage (%)
Erectile dysfunction		
Present	27	42.19
Absent	37	57.81
Severity of erectile dysfunction (n = 27)		
Mild erectile dysfunction	05	18.52
Moderate erectile dysfunction	12	44.44
Severe erectile dysfunction	04	14.81
Non-interpretable	06	22.22
Other sexual disorders		
Decreased libido	38	59.38
Ejaculation disorders	05	07.81

- Age ($p < 0.001$), the risk of developing ED was 6 times greater in patients aged at least 40 years (PR = 6.03). Of the 27 patients over 40 years old, 22 (81.48%) had an ED, compared with 5 out of 37 (13.51%) under 40 years old.
- Excessive alcohol consumption ($p = 0.001$), patients with excessive alcohol consumption had about 3 times the risk of developing ED (PR = 2.70). Of the 13 patients who consumed more than 30 g of alcohol per day, 11 (84.62%) had ED, compared with 16 out of 51 patients (31.37%) who consumed little or no alcohol.
- Hepatocellular carcinoma ($p = 0.021$), patients with hepatocellular carcinoma had about twice the risk of developing ED (PR = 2.31). In this study, 22 of the 42 patients (52.38%) with hepatocellular carcinoma had ED. Whereas ED was noted in 5 out of 22 patients (22.73%) without hepatocellular carcinoma.
- Class C of the Child-Pugh score ($p = 0.010$), patients in Child-Pugh class C had about twice the risk of developing ED (PR = 2.13). Of the 26 patients in Child Pugh class C score, 16 (61.54%) had an ED; compared to 11 of the 38 patients (28.95%) with a Child Pugh class B or A score.

Table 4 shows the relationship between ED and patient data.

4. Discussion

This study made it possible to calculate the frequency of erectile dysfunction, to determine the other associated sexual disorders and to identify the associated factors of ED among patients with cirrhosis in Parakou. This is one of the rare studies addressing this topic in Benin. Standard and validated criteria (Child-Pugh score, IIEF-5 score) were used during this study. Its prospective nature made it possible to collect the information and research the factors associated with ED in this population group.

Table 4. Relationship between erectile dysfunction and data of men with cirrhosis in bivariate analysis (CHUD-B/A, HIA-CHU, Parakou, 2022, n = 64).

	Total	Existence of ED		PR	$CI_{95\%}$	*p*
		N	%			
Age (Years)						<0.001
<40	37	05	13.51	1		
≥40	27	22	81.48	6.03	2.62 - 13.89	
Excessive consumption of alcohol						0.001
Yes	13	11	84.62	2.70	1.69 - 4.30	
No	51	16	31.37	1		
Hepatocellular carcinoma						0.021
Yes	42	22	52.38	2.31	1.01 - 5.25	
No	22	05	22.73	1		
Child-Pugh class C						0.010
Yes	26	16	61.54	2.13	1.19 - 3.81	
No	38	11	28.95	1		

ED = Erectile dysfunction.

In the present study, the frequency of ED was 42.19%. This result is similar to the frequency of 41.2% reported by Thakur *et al.* [11] in India in 2019. It is lower than that noted by Guèye *et al.* [12] in 2022 in Senegal (52.2%) and by Toda *et al.* [7] in Japan in 2014 (92.3%). This result is superior to 29.4% found by El Atrebi *et al.* [13] in Egypt in 2011. This disparity in results could be related to the subjective nature of the statements made by patients about erectile dysfunction. It is a frequent pathology that affects the quality of life. Its actual frequency is under-estimated because of its taboo character.

The mean age of the subjects included in this study was 43.53 ± 13.13 years. This result is similar to 41 years reported by Guèye *et al.* [14] in Senegal in 2018. Dia *et al.* [15] also reported a mean age of 44 years in Senegal in 2019. The age of patients was associated with ED ($p < 0.001$). Patients aged at least 40 years were six times more likely to have ED (PR = 6.03). In the study conducted by Maimone *et al.* [16] in Italy in 2018, age was statistically associated with ED (OR = 1.058 95% CI = 1.015 - 1.103 p = 0.008). The frequency increased significantly with age. In 2014, Janini *et al.* [17] in Europe noticed that men with ED were older than those without ED. The same observation was made by Toda *et al.* [7] in 2019 in Japan, which found that advanced age was significantly associated with ED. Given the young age of the patients in the present study, ED would be related to cirrhosis and not to aging.

In this study, 55 patients out of the 64 included (85.94%), has a cirrhosis secondary to chronic hepatitis B virus infection. This high prevalence cirrhosis secondary to hepatitis B is explained by the fact that the study was carried out in

an environment with high endemicity for hepatitis B virus infection. Excessive alcohol consumption was statistically associated with ED (p = 0.001). Patients with excessive alcohol consumption had about 3 times more risk of developing ED (PR = 2.70). This finding is corroborated by the study of Gueye *et al.* [12] in Senegal in 2022. The authors reported that alcoholic cirrhosis was statistically associated with ED (p = 0.015). This could be explained by the fact that high doses of alcohol reduce testosterone production. In addition, alcohol consumption over several years could lead to alcoholic neuropathy.

In the present study, hepatocellular carcinoma was associated with the presence of ED (p = 0.021). Patients with hepatocellular carcinoma had about twice the risk of developing ED (PR = 2.31). Hepatocellular carcinoma is a serious complication of cirrhosis. It is characterized by a significant deterioration of the general health condition and the latter could explain the occurrence of ED.

The majority of the 64 patients included in this study were in Child-Pugh class B, however it was Child-Pugh class C that was associated with ED (p = 0.010). Patients in Child-Pugh class C had twice the risk of developing ED (PR = 2.13). This result could be explained by the worsening of liver failure in Child-Pugh class C leading to a hyperestrogenemia. This result is similar to those of Paternostro *et al.* [18] in Austria in 2018 who had reported a high frequency of ED among patients in Child-Pugh class B (n = 35; 43.8%) compared to 18.7% in Child-Pugh class C (n = 15). According to their study, the severity of ED increased significantly throughout the classes of Child-Pugh score. Child-Pugh class C was statistically associated with the presence of ED (p = 0.037). This result is also similar to those found by Guèye *et al.* [12] in 2022 in Senegal. Half of the patients were in Child-Pugh class B (50%) but Child-Pugh class C was statistically associated with ED (6%; p = 0.002). In Nigeria in 2014, Adékanle *et al.* [19] demonstrated more signs of ED in Child-Pugh class B (n = 26; 43.33%; p < 0.05) and class C (n = 17; 28.33%; p < 0.05).

The main limitations of this study are the small sample size, the absence of testosterone test in these patients and the subjectivity of information given by the patients. Further prospective studies including a large number of patients with cirrhosis is needed to better study ED in this population group.

5. Conclusion

In Parakou, erectile dysfunction, although taboo and underestimated, is common in patients with liver cirrhosis. It is noted in approximately two out of five patients with cirrhosis. It is more frequent when the cirrhosis is severe and the patients are elderly. Apart from erectile dysfunction, patients with cirrhosis also have low libido and ejaculation disorder. Aggravating and associated factors of the severity of erectile dysfunction among patients with cirrhosis in Parakou in 2022 are: advanced age, hepatocellular carcinoma, alcoholism and the Child-Pugh class C. The modifiable factors (excessive alcohol consumption, non-follow-up of cirrhosis progressing to a Child-Pugh class C) must be avoided in order to pre-

vent erectile dysfunction. The latter must be systematically sought in all patients with cirrhosis to ensure comprehensive care, thus improving their quality of life.

Conflicts of Interest

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

References

[1] Kim, M., Kim, S.Y., Rou, W.S., Hwang, S.W. and Lee, B.S. (2015) Erectile Dysfunction in Patients with Liver Disease Related to Chronic Hepatitis B. *Clinical and Molecular Hepatology*, **21**, 352-357. https://doi.org/10.3350/cmh.2015.21.4.352

[2] Gareri, P., Castagna, A., Francomano, D., Cerminara, G. and De Fazio, P. (2014) Erectile Dysfunction in the Elderly: An Old Widespread Issue with Novel Treatment Perspectives. *International Journal of Endocrinology*, **2014**, Article ID: 878670. https://doi.org/10.1155/2014/878670

[3] Lee, J.C., Bénard, F., Carrier, S., Talwar, V. and Defoy, I. (2011) Do Men with Mild Erectile Dysfunction Have the Same Risk Factors as the General Erectile Dysfunction Clinical Trial Population: Risk Factors in Mild Erectile Dysfunction. *BJU International*, **107**, 956-960. https://doi.org/10.1111/j.1464-410X.2010.09691.x

[4] Giuliano, F. and Droupy, S. (2013) Dysfonction érectile. *Progrès en Urologie*, **23**, 629-637. https://doi.org/10.1016/j.purol.2013.01.010

[5] Sarkar, M., Lai, J.C., Sawinski, D., Zeigler, T.E., Cedars, M. and Forde, K.A. (2019) Sex Hormone Levels by Presence and Severity of Cirrhosis in Women with Chronic Hepatitis C Virus Infection. *Journal of Viral Hepatitis*, **26**, 258-262. https://doi.org/10.1111/jvh.13027

[6] Chung, S., Keller, J.J., Liang, Y. and Lin, H. (2012) Association between Viral Hepatitis and Erectile Dysfunction: A Population-Based Case-Control Analysis. *The Journal of Sexual Medicine*, **9**, 1295-1302. https://doi.org/10.1111/j.1743-6109.2012.02663.x

[7] Hunter, S.S., Gadallah, A., Azawi, M.K. and Doss, W. (2014) Erectile Dysfunction in Patients with Chronic Hepatitis C Virus Infection. *Arab Journal of Gastroenterology*, **15**, 16-20. https://doi.org/10.1016/j.ajg.2014.01.012

[8] Sorrell, J.H. and Brown, J.R. (2006) Sexual Functioning in Patients with End-Stage Liver Disease before and after Transplantation. *Liver Transplantation*, **12**, 1473-1477. https://doi.org/10.1002/lt.20812

[9] Yafi, F.A., Jenkins, L., Albersen, M., Corona, G., Isidori, A.M., Goldfarb, S., *et al.* (2016) Erectile Dysfunction. *Nature Reviews Disease Primers*, **2**, Article No. 16003. https://doi.org/10.1038/nrdp.2016.3

[10] Rosen, R.C., Cappelleri, J.C., Smith, M.D., Lipsky, J. and Pena, B.M. (1999) Development and Evaluation of an Abridged, 5-Item Version of the International Index of Erectile Function (IIEF-5) as a Diagnostic Tool for Erectile Dysfunction. *International Journal of Impotence Research*, **11**, 319-326. https://doi.org/10.1038/sj.ijir.3900472

[11] Thakur, J., Rathi, S., Grover, S., Chopra, M., Agrawal, S., Taneja, S., *et al.* (2019) Tadalafil, a Phosphodiesterase-5 Inhibitor, Improves Erectile Dysfunction in Patients with Liver Cirrhosis. *Journal of Clinical and Experimental Hepatology*, **9**, 312-317. https://doi.org/10.1016/j.jceh.2018.07.007

[12] Gueye, M.N. (2022) Sexual Dysfunction in Cirrhosis: A Prospective Multicenter

Study. *Gastroenterology, Hepatology & Digestive Disorders*, **5**, 1-5. https://doi.org/10.33425/2639-9334.1064

[13] El-Atrebi, K., El-Bassyouni, H. and El-Atrebi, M. (2011) Sexual Dysfunction in Males with Hepatitis C Virus: Relevance to Histopathologic Changes and Peginterferon Treatment. *Saudi Journal of Gastroenterology*, **17**, 406-410. https://doi.org/10.4103/1319-3767.87183

[14] Guèye, M.N., Louise, B.M., Malick, B., Salamata, D., Aïssé, T.M., Ambdil, H., *et al.* (2018) Anomalies électrocardiographiques et échocardiographiques au cours de la cirrhose virale b: A propos de 60 cas au service d'hepato-gastroenterologie de l'Hopital Aristide Le Dantec de Dakar (HALD). *The Pan African Medical Journal*, **30**, Article 169. https://doi.org/10.11604/pamj.2018.30.169.12344

[15] Dia, D., Diouf, G., Gueye, M.N., Cisse, C.A.B., Cisse, M. and Mbengue, M. (2019) Clinical, Paraclinical and Etiological Aspects of Cirrhosis in a Department of Internal Medicine in Senegal. *Advanced Research in Gastroenterology & Hepatology*, **12**, Article ID: 555836. https://doi.org/10.19080/argh.2019.12.555836

[16] Maimone, S., Saffioti, F., Oliva, G., Di Benedetto, A., Alibrandi, A., Filomia, R., *et al.* (2019) Erectile Dysfunction in Compensated Liver Cirrhosis. *Digestive and Liver Disease*, **51**, 843-849. https://doi.org/10.1016/j.dld.2018.10.015

[17] Jannini, E.A., Sternbach, N., Limoncin, E., Ciocca, G., Gravina, G.L., Tripodi, F., *et al.* (2014) Health-Related Characteristics and Unmet Needs of Men with Erectile Dysfunction: A Survey in Five European Countries. *The Journal of Sexual Medicine*, **11**, 40-50. https://doi.org/10.1111/jsm.12344

[18] Paternostro, R., Heinisch, B.B., Reiberger, T., Mandorfer, M., Schwarzer, R., Seeland, B., *et al.* (2018) Erectile Dysfunction in Cirrhosis is Impacted by Liver Dysfunction, Portal Hypertension, Diabetes and Arterial Hypertension. *Liver International*, **38**, 1427-1436. https://doi.org/10.1111/liv.13704

[19] Adekanle, O., Ndububa, D., Orji, E. and Ijarotimi, O. (2014) Assessment of the Sexual Functions of Males with Chronic Liver Disease in South *West Nigeria. Annals of African Medicine*, **13**, 81-86. https://doi.org/10.4103/1596-3519.129884

Appendix: Survey Sheet

Frequency and associated factors of erectile dysfunction among patients with liver cirrhosis in Parakou, Republic of Benin in 2022

Date of investigation: ……/……/……. Medical record number: ……

Identification number: /_____/ Center : ……

I. Sociodemographic Data

Q-1. Age (years): ……/_____/

Q-2. Ethnicity: ……/_____/

1-Otamari and related 2-Bariba and related 3-Fulani 4-Dendi and related

5-Lokpa 6-Fon and related 7-Yom 8-Nagot

9-Yoruba 10-Other ……

Q-3. Religion: ……/_____/

1-Christianity 2-Islam 3-Animism 4-Other ……..…..

Q-4. Residence: Urban ☐ Rural ☐

Q-5. Socio-professional status: ……/_____/

I-Unemployment 2-Pupil/Student 3-Employee (public or private) 4-Artisan/Laborer

5-Farmer 6-Breeder 7-Trader 8-Housekeeper

9-Other:……

II. Clinical and Paraclinical Data

1. Interview

Q-6. Reason for consultation : ……/_____/

1-Poor general condition 2-Ascites 3-Edema and ascites 4-Abdominal pain

5-Altered state of consciousness 6-Abdominal mass 7-Other ……

Q-7. Admission method: ……/_____/

1-Emergency 2-Outpatient consultation 3-Referral

Q-8. Date of onset of illness: ……...

Q-9. Lifestyle: ……...

-Excessive consumption of alcohol: Yes ☐ No ☐

If yes, quantification in grams per day: <30 grams ☐ ≥30 grams ☐

-Smoking: Yes ☐ No ☐

If yes, Number of package/year ……. Not applicable ☐

Q-10. Medical history and comorbidities: ……/_____/

1- Diabetes ☐ 2-HBP ☐ 3-prostatic adenocarcinoma ☐ 4-Cardiopathy ☐

5-Prostatic neoplasia ☐ 6- Stroke ☐ 7-Epilepsy ☐ 8-Others……..

Q-11. Previous treatment: ……/_____/

1-Beta blockers ☐ 2-Hormone therapy ☐ 3-Anxiolytics ☐

4-Antidepressant ☐ 5-Others……

2. DIAGNOSIS OF LIVER CIRRHOSIS

Q-13. Signs of portal hypertension:……/_____/

1-Abdominal collateral circulation 2-Splenomegaly 3-Thrombocytopenia 4-portal vein dilatation

Q-14. Signs of liver failure: ..... /_____/

1-Gynecomastia	Yes ☐	No ☐
2-Palmar erythema	Yes ☐	No ☐
3-Terry's nails	Yes ☐	No ☐
4-Prothrombin Time < 70%	Yes ☐	No ☐
5-Hypoalbuminemia	Yes ☐	No ☐

Q-15. Hepatomegaly Yes ☐ No ☐

-Painful	1-Yes	2-No	
-Surface.....	1-smooth	2-irregular	3-nodular
-Consistency.....	1-firm	2-hard	3-stony
-Bottom edge.....	1-soft	2-firm	3-indeterminate

Q-16. Causes: ..... /_____/

1-HBV infection	Yes ☐	No ☐
2-HCV infection	Yes ☐	No ☐
3-Alcohol	Yes ☐	No ☐
4-Autoimmune hepatitis	Yes ☐	No ☐

Q-17. Child-Pugh score: ...../_____/

	1	2	3
Encephalopathy	None	Grade 1 or 2	Grade 3 or 4
Ascites	Absent	Slight	Moderate
Bilirubin (mg/dl)	<20	20-30	>30
Albumin (g/dl)	>35	28-35	<28
Prothrombin	>50	40-50	<40

Child-Pugh A: 5 to 6 **Child-Pugh B:** 7 to 9 **Child-Pugh C:** 10 to15

3-DIAGNOSIS OF ED

Q-18. Existence of ED: ..... /_____/

1-Yes ☐ 2-No ☐

Q-19. Severity assessment: (IIEF-5 Score):

I-How do you rate your confidence that you could get and keep an erection?

1. Very low 2. Low 3. Moderate 4. High 5. Very high

II-When you had erections with sexual stimulation, how often your erection hard enough for penetration?

0. I was not 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 always or always

III-During sexual intercourse, how often were you able to maintain your erection after you had penetrated your partner ?

0. I haven't tried 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 always or always

IV-During sexual intercourse, how difficult was it to maintain your erection to completion of intercourse?

0. I haven't tried to have sex 1. Extremely difficult 2. Very difficult

3. Difficult 4. Slightly difficult 5. Not difficult

V-When you attempted sexual intercourse, how often was it satisfactory for you?

0. I haven't tried 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 always or always

Interpretation:…….. /_____/

1-Severe erectile dysfunction: 5 to 10, 2-Moderate erectile dysfunction: 11 to 15

3-16 à 20 Mild erectile dysfunction: 16 to 20 4-Normal erectile function: 21 to 25

5- Not interpretable: 1 to 4

4-EXISTENCE OF OTHER SEXUAL DISORDERS

1-Decreased libido	Yes ☐	No ☐
2-Ejaculation disorder	Yes ☐	No ☐

Q-20. Other biological tests (Blood Count)

Hb = ……g/dl MCV =……fl MCHC =…..g/dl MCH=……pg

Q-21. Complications and type of decompensation

1-Ascites	Yes ☐	No ☐
2-Gastrointestinal bleeding	Yes ☐	No ☐
3-Hepatic encephalopathy	Yes ☐	No ☐
4-Hepatocellular carcinoma	Yes ☐	No ☐
5-Hydrothorax	Yes ☐	No ☐
6-Hepatorenal syndrome	Yes ☐	No ☐