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Prevalence and Factors Associated with Erectile Dysfunction in Diabetic Patients at the National University Hospital Center Hubert Koutoukou Maga in Cotonou

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Abstract

Erectile dysfunction was one of the most common complications in diabetic patients. According to several studies, its prevalence was two to three times higher in diabetics than in the general population. But it has often been overlooked despite the fact that it seriously affects the quality of life. The aim of this study was to determine the prevalence of erectile dysfunction and its associated factors in diabetics' patients. This was a cross-sectional analysis study of 76 male diabetic patients who consulted by the Department of Endocrinology from June 22, 2019 to September 25, 2019. Erectile dysfunction was diagnosed by calculating the IIEF score. Statistical comparisons were made between patients without and with Erectile dysfunction chi-square test with a significance level p < 0.05. A logistic regression was performed in order to obtain the adjusted odds ratios. Our study included 76 patients with the mean age of 58.55 ± 10.5 years. 72.37% of them were over 50 years old. Erectile dysfunction screening was positive in 69.74%. HbA1c was ≥7% in 50 patients (65.79%). High blood pressure, imbalance in diabetes and its duration are factors that are significantly associated with Erectile dysfunction after logistic regression with p values equal to 0.011, respectively; 0.008 and <0.001. **Conclusion:** This study showed a high prevalence of erectile dysfunction in diabetics. Significant concomitant factors were hypertension, diabetes imbalance and the duration of diabetes. It was, therefore, important to include systematic screening for erectile dysfunction at least annually, as well as other complications of diabetes.

1. Introduction

Diabetes was a major public health problem. Its ever-increasing prevalence was inevitably accompanied by an increase in morbidity and mortality.

Erectile dysfunction (ED) was one of the most common chronic complications in male diabetic patients. The prevalence of erectile dysfunction in men with diabetes was three times higher globally than in the general population [1]. In the study "Massachusetts Male Aging Study" (MMAS), after correction of the age factor, the probability of having complete erectile dysfunction was 3 times higher in diabetics compared to non-diabetics (28% against 9.6%) [2]. In addition, the onset of erectile dysfunction is earlier in diabetic men than in non-diabetic men [3] [4]. Factors explaining this prevalence were dominated by diabetes-induced vascular changes that severely and early disrupt erectile physiology and the advanced age of diabetic patients, especially type 2 [5] [6] [7]. Nitric oxide (NO) is necessary to induce smooth muscle relaxation in the corpus cavernosum, resulting in sinusoidal filling and penile erection [8]. When compared with control subjects, diabetic men with ED have impaired neurogenic and endothelium-mediated relaxation of smooth muscle, increased accumulation of advanced glycation end products (AGEs), and altered expression of arginase, a competitor with NO synthase (NOS) for its substrate L-arginine [9] [10].

2. Patients and Study Method

This was an observational, cross-sectional and analytical study conducted from June 22 to September 25, 2019 in the Endocrinology, Metabolism and Nutrition departments of the CNHU-HKM in Cotonou. All the study population consisted of diabetic male who were consulted in our department during this period. To assess erectile function, patients were given a brief 5-point International Index of Erectile Function (IIEF-5) questionnaire. [11]. Erectile dysfunction is present when the score is less than 21, it is said to be mild when the score is between 16 and 20 points, moderate between 11 and 15 points and severe between 5 and 10 points. For scores between 21 and 25 erectile function is considered normal.

Inclusion criteria were age under 80, informed consent and glycated hemoglobin less than 3 months old. Those with an International Index of Erectile Function (IIEF-5) score of <5 were excluded. The data collected was coded and entered using Epidata software. Statistical analysis was performed using R 3.6.1 software. Statistical comparisons were made between patients "without erectile dysfunction" and "with erectile dysfunction" by the chi 2 test.

We then did a multivariate logistic regression to determine the odds ratio.

Only variables showing significance were considered during the multivariate analysis. For the different associations, the significance threshold is 5%.

3. Results

Socio-demographic characteristics (Table 1)

A total of 76 patients were included in our study. Their average age was 58.55 ± 10.5 years and those over 50 were predominant at 72.37%. In terms of level of education, 43.42% had a higher level and 38.16% had a secondary level. They were married in 88.16% of cases.

Frequency of Erectile dysfunction

Erectile dysfunction was noted in 53 patients, a frequency of 69.74%. The classification of erectile function in these patients according to the IIEF-5 is illustrated in Figure 1.

Table 1. Scio-demographic characteristics.

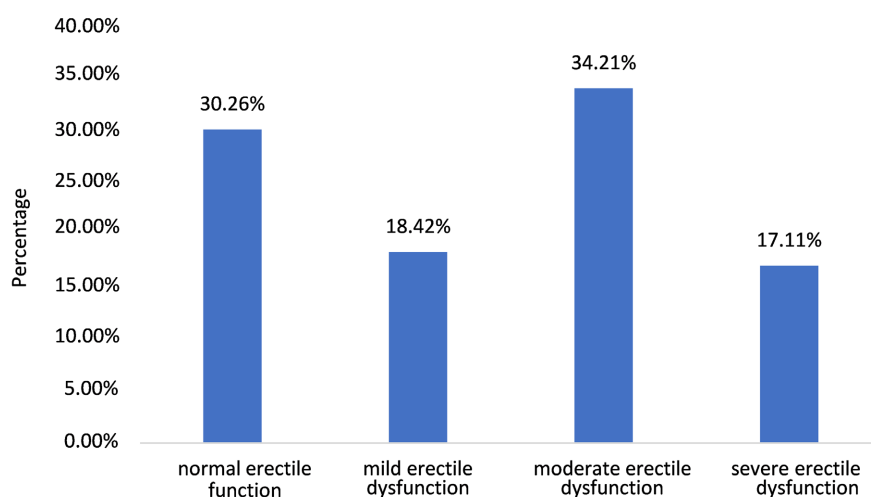| Characteristics	Modalities	Population	Percentage (%)
Patient age	<50 years	21	27.63
	≥50 years	55	**72.37**
Educational level	None	03	03.95
	Primary	11	14.47
	Secondary	29	38.16
	University	33	**43.42**
Marital status	Unmarried	01	01.32
	Married	67	**88.16**
	Divorced	06	07.89
	Widower	02	02.63

Figure 1. Distribution of patients according to their erectile function.

Description of other independent variables (Table 2)

The percentage of overweight and obesity patients was found to be 53.95% and 15.79% respectively. Smoking was noted in 14.47% and alcoholism in 60.53% of patients. High blood pressure and chronic glycemic imbalance were noted respectively in 53.95% and 65.79% of cases.

Univariate analysis of behavioral characteristics (Table 3)

Table 2. Distribution of other independent variables.

Indpendants variables	Modalities	Population	Percentage (%)
IMC	Obese	12	15.79
	Patients	41	**53.95**
	Overweight	22	28.95
	Normal underweight	01	01.32
Physical activities	None	18	23.68
	Sometimes	40	**52.63**
	Often	18	23.68
Alcohol	Yes	46	**60.53**
	No	30	39.46
Smoke	Yes	11	14.47
	No	65	**85.53**
High blood pressure (HBP)	Yes	41	**53.95**
	No	35	46.05
Duration of HBP	<5	01	02.44
	5 - 10 years	12	29.27
	>10 years	28	**68.29**
Duration of diabete	<5 years	21	27.63
	5 - 10 years	25	32.89
	>10 years	30	**39.47**
HbA1c	<7 years	26	34.21
	≥7 years	50	**65.79**

Table 3. Erectile dysfunction (ED) association with behavioral characteristics.

	Percentage (%)		
	Presence of ED	Absence of ED	p-value
Physical activities			
None	5.26	18.42	0.312
Sometimes	14.47	38.16	
Often	10.53	13.16	
Alcohol			
Yes	19.74	40.79	0.62
No	10.53	28.95	
Smoke			
Yes	2.63	11.84	0.488
No	27.63	57.89	

We did not note significantly more cases of ED in those who smoke compared to non-smokers. The same thing is observed for those who practiced physical activity and those who did not univariate analysis of clinical characteristics (Table 4).

High blood pressure, chronic glycemic imbalance and having had diabetes for more than ten years are statistically associated with erectile dysfunction.

Multivariate analysis (Table 5)

After logistic regression, only high blood pressure, diabetes duration and diabetes imbalance have a statistically significant association with the occurrence of erectile dysfunction. It showed that diabetic patients with high blood pressure were 2.44 times more likely to suffer from erectile dysfunction.

In addition percentage of ED in diabetic patients elevate (3.59%) as the disease duration increase.

Patients with unbalanced diabetes are 21.23 times more likely to suffer from erectile dysfunction than patients with balanced diabetes.

4. Discussion

Prevalence of erectile dysfunction

The prevalence of erectile dysfunction calculated in the current study is 69.74% which is seen to be lower than that found by Wanvoegbe *et al.* (92%) in Benin in 2016 [12], and 82% by El Achhab *et al.* in 2008 in Morocco [13]. This

Table 4. Erectile dysfunction association with clinical features.

	Percentage		
	Absence of ED	Presence of ED	p-value
HBP			
yes	9.21	44.74	**0.011**
no	21.05	25	
Duration of HBP			
<5 years	0	2.44	
5 - 10 years	4.88	24.39	1
>10 years	12.20	56.1	
IMC			
Underweight	0	1.32	
Normal	7.89	21.05	0.848
Overweight	19.74	34.21	
Obesity	2.63	13.15	
Duration of diabete			
<5 years	15.79	11.84	
5 - 10 years	7.89	25	**0.009**
>10 years	6.58	32.89	
HbA1c < 7	26.31	7.89	
HbA1c ≥ 7	3.96	61.84	**<0.001**

Table 5. Multivariate analysis.

	Univariate analysis			Multivariate analysis		
	OR	[IC95%]	p	ORa	[IC95%]	p
Age						
<50 years	1		0.012			
≥50 years	8.34	[2.37 - 15.78]				
HBP						
No	1		0.01	1		0.011
Yes	2.39	[1.48 - 7.33]		2.44	[1.62 - 8.12]	
Duration of diabete						
<5 years						
5 - 10 years	1			1		
>10 years	2.54	[1.33 - 6.81]	0.009	2.42	[1.28 - 6.71]	0.008
	3.78	[1.82 - 9.24]		3.59	[1.33 - 8.85]	
HbA1c						
<7	1		<0.001	1		<0.001
≥7	20.71	[7.33 - 32.75]		21.23	[8.42 - 32.37]	

difference may be due to our sample size being smaller. Moreover, it was close to the 72.7% of Raharinavalona *et al.* in 2017 in Madagascar [14] and the 74% reported by Sagna *et al.* in 2011 in Burkina-Faso [15]. On the other hand, the prevalence of EDn diabetics calculated in the current study was higher than that reported by Gueye in 1998 (16%) in Senegal [16] and the 48% by Balde N. in Guinea in 2006 [17].

Factors associated with erectile dysfunction in diabetics from the CNHU-HKM Seventy-two point thirty-seven percent (72.37%) of the patients were aged ≥ 50 years and this age modality did not appear to be significantly associated with erectile dysfunction at the end of the multivariate analysis. Gueye *et al* had made the same observation [18]. On the other hand, several authors have found that age was associated with erectile dysfunction. These are Siu *et al.* in China in 2001 [19], Achhab *et al.* in Morocco in 2008 [13]. Marital status and level of education had no influence on the occurrence of erectile dysfunction in our study. Our results corroborate those of Monabeka *et al.* in 2016 [20].

In addition, high blood pressure was strongly associated with the occurrence of erectile dysfunction. Zakhama W *et al.* also found the association of high blood pressure with erectile dysfunction [21]. However, the influence of antihypertensive treatments on the occurrence of erectile dysfunction could not be demonstrated in the present study. We did not find a relationship between erectile dysfunction and obesity although it has been described by some authors [21] as risk factors for erectile dysfunction. Monabeka *et al.* [20] had found a relationship between abdominal obesity and the occurrence of erectile dysfunction.

We did not find a relationship between the consumption of alcohol, tobacco and the occurrence of erectile dysfunction. In Côte d'Ivoire as in Guinea, no association between smoking and erectile dysfunction in diabetics has been demonstrated [17]. The same is true for alcohol consumption in China and Denmark [19] [22]. However, for Kalter-Leibovici *et al.* in Israel, moderate alcohol consumption reduced the risk of developing erectile dysfunction in diabetics [23].

Our study showed that the poor balance of diabetes (HbA1c ≥ 7) was linked to the occurrence of erectile dysfunction with a significance p < 0.001. Converging results have been found in the literature [15] [24] [25]. But several studiesave not found a link between the poor balance of diabetes and erectile dysfunction [16] [19] [26].

Compared to the seniority of the diabetes, we found that an old diabetes of more than 10 years favored the occurrence of erectile dysfunction (p = 0.008). Some authors reported, that the duration of diabetes played a role in the occurrence of erectile dysfunction [24] [27]. For others like Ziael-Rad this was not the case [26].

Lastly, the current study has a weak point. Thereby we did not take into account in the analysis the effect of antihypertensives in the occurrence or worsening of erectile dysfunction.

5. Conclusions

The frequency of erectile dysfunction was high in diabetic patients at the CNHU-HKM in Cotonou.

The main factors associated with the occurrence of erectile dysfunction were high blood pressure, the imbalance of diabetes and the duration of diabetes.

It was, therefore, important to associate screening for erectile dysfunction systematically, at least annually, in the same way as the other chronic complications of diabetes in order to guarantee good sexual and psychological health for these patients.

Conflicts of Interest

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

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