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Original Article

The prevalence of Peyronie's disease in diabetic patients -2018- Yazd

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ABSTRACT

Introduction: Peyronie's disease (PD) is the fibrous scar tissue inside the penis that causes curved and painful erections. PD is associated with, diabetes, hypertension, dyslipidemia and low testosterone. PD causes erectile dysfunction (ED). The aim of this study was to evaluate the prevalence of PD in type 2 diabetic (T2DM) patients in Yazd.

Methods: This cross-sectional study was conducted on 317 patients with T2DM referred to the Diabetes Research Center of Yazd. Inclusion Criteria were: T2DM, ages 30–65 years old, having a medical record at the Yazd diabetes research center, willingness to participate in research. Exclusin criteria contain: history of smoking and using anti-depressive drugs. Data was analyzed using with SPSS-16 and Stata software. Descriptive tables and charts were used and statistical tests such as independent sample T-test and Fisher's exact test were used.

Results: A total number of 317 male patients were enrolled. The prevalence of diabetes microvascular complications were as following; neuropathy 36.30% (30.97–41.38), retinopathy 24.30% (19.67–29.39), nephropathy 20.50% (16.19–25.37), and PD 3.80% (1.97–6.51).

Conclusion: There was no difference in the prevalence of PD in our study with the global studies. But there is a higher prevalence of PD in diabetic patients than the general population.

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1. Introduction

Peyronie's disease (PD) is the fibrous scar tissue inside the penis that causes curved and painful erections [1]. In addition etiology of PD is not completely unknown; The etiology of the PD plaque is that it cause from trauma to the erect penis [2]. Also he treatment of this disease is difficult. There is currently no effective therapeutic treatment for PD [3].

The complications of PD include shortness and penis curvature, erectile pain, stiffness and penile stiffness, erectile dysfunction, and impotence during intercourse [4]. Criteria for diagnosis of PD is usually from the patient history and penile examination [5]. PD treatment contains oral supplements or medications, intralesional injections, or surgery (6).

PD is also associated with diabetes, hypertension, dyslipidemia, and low testosterone. PD also causes erectile dysfunction and decreases the quality of life of both - sex partner and increase risk of depression, low self-esteem, and relationship problems [7–9]. That is resulting in curvature or other deformities of the erect penis and sexual disability [10].

Prevalence of PD rates range from 0.5 to 20.3% within specific populations. Rates may be greater among men with comorbidities. Prevalence rates of PD have been under-estimated in more studies [11].

In 1991 prevalence of PD was 0.39% in Rochester, Minnesota [9]; in the study of Cologne and et all reported the prevalence of DM in men with PD about 18.3% and in those unaffected 0.6% [12]. Prevalence of PD was 0.7% in US-2016. Worldwide PD prevalence is estimated between 3–9% in adult men [6].

Diabetes is one of the most common risk factors for the PD. Epidemiological studies have shown PD is more common in type 2 diabetes mellitus (T2DM) patients which varies between 8 and 20% but PD prevalence in general population is 4.4–7% [13,14]. But PD prevalence increases to 20.3% in T2DM with ED (15). T2DM is prevalent in Yazd; While there is no evidence of prevalence of PD in T2DM of Yazd.The current study aimed to examine the prevalence of PD in diabetic patient referring to the Diabetse Research Center, Yazd.

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2. Methods

This cross-sectional study was done from August 2017 to May 2018 in Diabetes research center, Yazd. The studied sample were collected by convenient method.

The sample size was calculated using the prevalence: 0.09, difference: 0.031, α:0.05 and power: 80% [6]. The data collection checklist included; demographic, body measurements (weight, height and body mass index (BMI), hemoglobin A1c (HbA1c), duration of T2DM, microvascular complications of T2DM (neuropathy, retinopathy and nephropathy), T2DM medications. The researcher completed all the required data during interview with patients. Retinopathy was checked by the ophthalmologist. Nephropathy was checked with urine analysis that the nephrologist reported. HbA1c was measurement by high performance liquid chromatography method by TosohG8 HPLC Analyzer.

Inclusion Criteria were: T2DM, ages 30–65 years old, having a medical record at the Yazd diabetes research center, willingness to participate in research. Exclusin criteria contain: history of smoking and using anti-depressive drugs.

All of included T2DM patients were referred to a same urologic surgeon. PD diagnosis was done according the careful medical history (penile deformity, interference with intercourse, penile pain or distress). Also the physical exam of genitalia region was done for all patients.

The present study was approved by Shahid Sadoughi University of Medical Sciences'ethics committee (code of ethics: IR. SSU. REC. 1396.101).

SPSS software, version 16 (chicago, spss Inc) were used for all statistical analyses and Stata software, version 14.1 (StataCorp, College Station, TX) were used to determine the 95% confidence interval (95% CI). Descriptive tables and charts were used. Statistical tests such as independent sample T-test and Fisher's exact test were applied. A significance level was considered for all tests $p \leq 0.05$.

3. Results

A total number of 317 male patients were enrolled to study. The median (±interquartile range) age of studied patients was 58 (±9) and 71.30% of the subjects were over 50 years old. The median (±IQR) of BMI of the patient was 28.23(± 4.80). Most of the subjects had a BMI of 25–30 (31.8%). Among them, 44.80% of the subjects had diploma and higher education. 123 (38.80%) patients were Retired. The median (±IQR) HbA1c was calculated 7.50(± 1.80) in the patients. In our sample, 173 (54.60%) patients had HbA1c hemoglobin higher than 7. Diabetes oral medication frequency was 160 (50.50%). Tthe median (±IQR) duration of diabetes medication were 10 (±11). Most of the patients (53.30%) had duration of diabetes medication less than 10 years (Tables 1 and 2).

Table 3
Prevalence of diabetes microvascular complications in studied patients.

		Frequency	Percentage
Nephropathy	No	213	67.20
	Microalbuminuria	49	15.50
	Proteinuria	14	4.40
	ESRD	2	0.60
Neuropathy	No	115	36.30
	Yes	70	53.60
Retinopathy	No	209	65.90
	Mild	24	7.60
	Moderate	9	2.80
	Severe	4	1.30
	PDR	40	12.60

Table 1
Baseline characteristics of studied T2DM patients.

		Frequency	Percentage
Age(Year)	≤ 50	63	19.90
	> 50	226	71.30
BMI(kg/m^2)	< 25	53	16.70
	25–30	141	44.50
	> 30	92	29
Level of Education	Lower diploma	131	41.30
	Diploma and higher	142	44.80
Job	Unemployed	11	3.50
	Worker	9	2.80
	Employee	26	37.50
	Retired	123	8.20
	Other	119	38.80
HbA1c($m\ mol/mol$)	< 7	103	32.50
	> 7	173	54.60
Diabetes medication	No medication	5	1.60
	Insulin medication	33	10.40
	Oral medication	160	50.50
	Insulin & Oral medication	91	28.70
Duration of diabetes medication	< 10	169	53.30
	> 10	120	37.90

Table 2
Mean of characteristics of studied patients.

	PD	Without PD	Total	P.value
Age(Year)	57.25 ± 5.98	55.60 ± 6.73	58 ± 9	0.40
BMI(kg/m^2)	27.48 ± 2.22	28.57 ± 3.83	28.23 ± 4.80	0.35
Duration of diabetes medication (Year)	11 ± 6.91	10.33 ± 7.34	10 ± 11	0.75
HbA1c($m\ mol/mol$)	7.72 ± 1.45	7.75 ± 1.52	7.50 ± 1.80	0.94

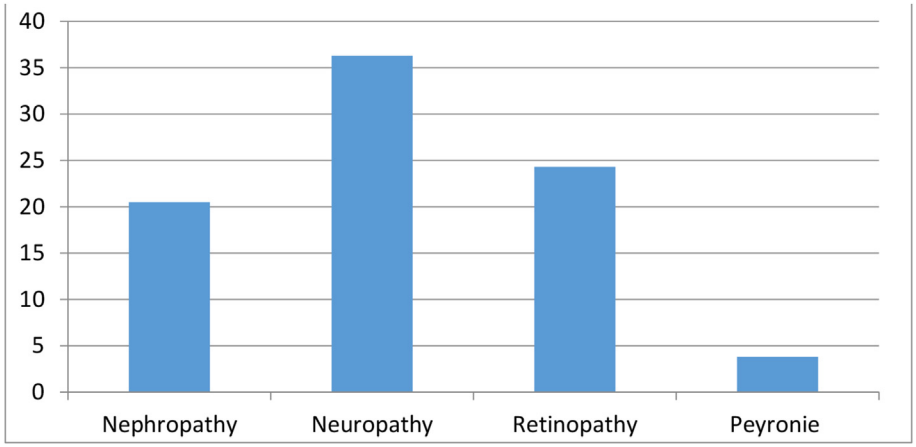

Fig. 1. Prevalence of nephropathy, neuropathy, retinopathy and PD in studied patients.

The prevalence of microalbuminuria was 15.50% (CI: 16.19–25.37). (Table 3). The prevalence of microvascular complications of studied patients were noted as; neuropathy 36.30% (CI:30.97–41.38), retinopathy 24.30% (CI:19.67–29.39), nephropathy 20.50% (CI:16.19–25.37), and PD 3.80% (CI:1.97–6.51) (Fig. 1).

The prevalence of PD in patients with HbA1c higher than 7 was 4.04 (1.64–8.15) and in patient with nephropathy was 6.15 (1.70–15.01) and in patient with retinopathy was 2.59 (0.31–9.06) and in patient with neuropathy was 4.11 (1.67–8.29). (Table 4).

4. Discussion

Estimating the prevalence of PD is a challenge for physician; because patients may not talk about their symptoms. In the present study, the prevalence of PD was estimated about 3.80% in diabetic patients.

Epidemiological Studies estimated the prevalence of PD between 3.2 and 8.9% in population-based studies and 16% in men with erectile dysfunction [5,11]. In the study of Pavone et al. [16], El-Sakka et al. [17], and Arfa et al. [15], the prevalence of PD in diabetic patients was 24%, 8.1% and 20.3% respectively.

The higher prevalence of PD in the study of Pavone et al. [16], was explained that the samples included 279 consecutive patients referred to an urological outpatient clinic, so the probability of the PD has been higher. In the study of El-Sakka et al., the prevalence of PD in diabetic patients was more than our study since this study was conducted among diabetic patients with ED screened. Both noted differences could be result of selection bias. Also Arfa et al. study was among diabetic patients with erectile dysfunction.

In the study of Tefekli et al. [14], The prevalence of PD among men with diabetes and sexual dysfunction was 10.7%. ED has been associated with PD frequently.

Table 4
Prevalence of PD according to the microvascular complications of diabetes.

		Frequency	Prevalence (CI)
HbA1c	<7	4	3.88 (1.06–9.64)
	>7	7	4.04 (1.64–8.15)
Nephropathy	No	7	3.28 (1.33–6.65)
	Yes	4	6.15 (1.70–15.01)
Retinopathy	No	9	4.30 (1.98–8.01)
	Yes	2	2.59 (0.31–9.06)
Neuropathy	No	5	4.34 (1.42–9.85)
	Yes	7	4.11 (1.67–8.29)

In our study, the prevalence of PD in patients older than 50 years, increased to more than 4%, according with past studies [15,16].

In this study, the prevalence of PD was higher in subjects with HbA1c higher than 7 in comparison to less than 7. In the study of Kendirci et al., The presence of diabetes with the PD increased the severity of the PD [18].

4.1. Strengths and limitation

Our study was designed to evaluate the prevalence of PD in diabetic patient from the start and information was collected according the same purpose, so we decreased the selection's bias. Diagnosis was performed only by a physician, so we prevented the diagnostic's bias.

Restricting the study to patients who were referred to Diabetes Research Center and Clinics can be noted as this study limitation. So the result can be generalized to this category of patients.

4.2. Conclusion

PD is one of the most complex diseases in urology. Pathogenesis is still unknown. A wide range of prevalence has been noted in worldwide. There was no difference for the prevalence of PD in our study with the global studies. But there is a higher prevalence of PD in diabetes than general population.

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Conflicts of interest

There are no conflicts of interest.

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