Research Article

Prevalence and risk factors associated with erectile dysfunction in adults

Abstract

Introduction: Erectile dysfunction (ED) and associated risk factors represent a health problem that significantly affects the quality of life (QoL) of men worldwide, with individual, family, psychological and sexual involvement.

Objective: To determine the prevalence of erectile dysfunction and associated risk factors in patients aged 30 to 65 years.

Methods: Cross-sectional, descriptive study. To outpatients of HGZ/MF No.2, from December 2022 to May 2023, aged 30 to 65 years, who agree to participate in the study. Those under antidepressant treatment were excluded. Sociodemographic and clinical variables were analyzed. The IIEF-5 questionnaire was used to evaluate erectile dysfunction and the Montgomery-Asberg Scale for depression. Descriptive statistics and Chi2 were used to determine association between categorical variables with significant p-value <0.05 and SPSS v.23 for data analysis.

Results: 206 participants were surveyed with mean age 46.42 ± 10.18 years, 62.62%(n=129) with arterial hypertension, 36.89%(n=76) with diabetes mellitus, 44.7%(n=92) with dyslipidemia and 38.40%(n=79) depression. 47.5%(n=98) presented some degree of erectile dysfunction, light 42.22%(n=87), mean 5.3%(n=11). We found association between ED with age [p<0.001], blood pressure stage [p<0.001], DM2 [p<0.001], smoking [p=0.001], BMI [p=0.002], physical activity [p<0.001] and depression [p<0.001].

Conclusions: Erectile dysfunction was present in half of the surveyed users, finding association with comorbidities; being important as first level physicians, the adequate metabolic control in them, promoting physical activity and a mental health for its prevention.

Keywords: Erectile dysfunction, prevalence, risk factors

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Introduction

Erectile dysfunction (ED) represents a health problem that has a significant impact on the quality of life (QoL) of men worldwide.[1] ED is defined as the constant or recurrent inability of a man to achieve and/or maintain penile erection sufficient for satisfactory vaginal intercourse.[2] It is a multifactorial disease that includes vascular, neurogenic, hormonal, anatomic, psychological and emotional causes.[3,4] The risk factors that have been implicated in erectile dysfunction are age, smoking, dyslipidemia, arterial hypertension (AHT), diabetes mellitus (DM) and metabolic syndrome; however, depression has also been documented as a very important factor since it has been found to be related to a great extent with the pathology, hence the importance of using instruments such as the Montgomery-Asberg to measure the degree of depression. In different studies, other lifestyle factors such as obesity, physical activity, diet and smoking have been recorded as triggers for the onset and evolution of this pathology.[5] Currently, ED in young adults has gained importance and continues to be an understudied topic. In the international literature, a prevalence of 30% to 35% has been described in ages between 18 and 40 years. A study conducted in Mexico in 2001 reported a prevalence of 9.7% and 16% in this age group.

ED affects a large part of the population, increasing in incidence with age and comorbidities,[6] affecting more than 150 million men worldwide, and this figure is expected to double by 2025.[7] Under normal conditions, erections are the result of a combination of neurotransmitter and vascular smooth muscle response, which generates increased arterial flow to the cavernous sinusoids and smooth muscle cells, usually around the age of 40 to 70 years, this symptomatology begins.[7,8] Following the above considerations the psychological and sexual health of different populations is adversely affected during the 2019 coronavirus disease pandemic (COVID-19). However, little is known about the psychological distress and erectile function of recovered male patients with long-term COVID-19.[9] High-intensity cycling may have a negative impact on pelvic floor function in some men. Cardiovascular disease is preceded by increased ED.[10,11] The sexual function of psychotic patients should be thoroughly evaluated by the physician, it has been shown that modifiable cardiovascular factors in male smokers increase the prevalence of erectile dysfunction and reach up to 40% compared to 28% in the general population,[12,13] and consequently diabetes is present in 28.57% of patients with ED.[14] There are several instruments for the study of erectile dysfunction, one of them is the IEEF-5, which is a questionnaire widely validated for the Latin American population, used to evaluate erectile function. Among the characteristics that distinguish it, we find that it is a brief questionnaire, psychometrically valid and self-applicable.[15–17]

The risk factors that have been implicated in erectile dysfunction are age, smoking, dyslipidemia, arterial hypertension, diabetes mellitus, metabolic syndrome, depression and some medications. In different studies, other lifestyle factors have been recognized: obesity, physical activity, diet and smoking, as triggers for the onset of erectile dysfunction and evolution of this pathology, which is why we have undertaken the present study with the aim of identifying the prevalence of erectile dysfunction in our unit and the associated risk factors, mainly in patients between 30 and 65 years of age.

Material and methods

A descriptive cross-sectional study was conducted from December 2022 to May 2023 on 206 patients from the outpatient clinic of HGZ/MF No.2. The sample was calculated using the finite population formula; male patients aged 30-65 years, from the family medicine outpatient clinic attached to HGZ/MF No.2, who agreed to participate in the study and signed the informed consent form, were included. Patients with a mental disability that limited their ability to answer the questionnaire, patients who spoke a dialectic and paraplegics and/or with spinal cord injury at the lumbar and/or sacral level, or under antidepressant medical treatment were excluded.

Each participant who met the selection criteria was asked about age, comorbidities, smoking and physical activity (considered positive if physical activity was at least 150 minutes per week). They were also measured: body weight (kg) in light clothing, without shoes or socks; body size (kg); body (m) with a calibrated stadiometer, in an upright position, with heels together and feet separated at a 60º angle, head in the horizontal Frankfort plane (imaginary line joining the upper edge of the ear canal with the orbit of the eye), arms free at the sides and palms pointing towards the hips[18] and body mass index (BMI) was calculated by the Quetelet index. The BMI was categorized according to the WHO as underweight <18.5 kg/m2 , normal weight 18.5 - 24.99 kg/m2 , overweight 25 - 29.99 kg/m2 and obese ≥ 3 0 kg/m 219 . In addition, blood pressure (mmHg) was determined in the uncovered left arm, supported at the level of the heart, while sitting with the back straight and feet flat on the floor after a minimum resting period of 5 minutes, with a calibrated mercury baumanometer. Blood pressure was categorized according to the Clinical Practice Guideline (CPG), 2021, of the management of the patient with arterial hypertension as: normal 120-129/80-84 mmHg, high normal 130-139/ 85-89 mmHg, hypertension grade I 140-159/90-99 mmHg, hypertension grade II 160-179/100-109 mmHg and hypertension grade III ≥ 1 8 0 / ≥ 1 1 0 mmHg20.[19,20]

The results of cholesterol (mg/dl) and triglycerides (mg/dl) were recorded from the electronic file, and were no older than 6 months. The IIEF-5 (International Index of Erectile Function) questionnaire was applied, which is a multidimensional scale for the evaluation of erectile dysfunction (ED) with Cronbach's alpha of 0.73, consisting of 5 items (short version) with 5 possible answers on a Likert-type scale each, where 1 = never or almost never, 2 = less than half the time, 3 = half the time, 4 = more than half the time and 5 = almost always or always. The total score of all items was summed to classify the severity of erectile dysfunction as normal erectile function: 21-25 points, mild erectile dysfunction 16-20 points, medium from 11 to 15 points and severe from 5 to 10 points.

For the study of depression, the Montgomery - Asberg Scale was used, with Cronbach's alpha of 0.88, consisting of 10 items, with Likert-type multiple choice answers from 1 to 6, each one equivalent to a previously defined score, finally all the items are added to qualify it as: no depression: 0-6 points, mild depression: 7-19 points, moderate: 20-34 points and severe: 35 - 60 points. Descriptive statistics and Chi2 were used to determine association between categorical variables with significant p <0.05 and SPSS v.23 for data analysis. This work was evaluated and approved by the IMSS Local Health Research and Ethics Committee (R-2022-1603-011). All participants were aware of the objective of the research and cooperated freely.

Results

A total of 206 subjects between 30 and 65 years of age, attached to the Hospital General de Zona con Medicina Familiar No.2, were analyzed, 62.62%(n=129) suffered from arterial hypertension and 36.89%(n=76) from type 2 diabetes mellitus. Table 1 shows the sociodemographic and clinical characteristics of the population.

Table 1 Sociodemographic and clinical characteristics of outpatient clinic patients of HGZ/MF No.2 (n=206)

Variable	X ± SD	(RIC)
Age (years)	46.42 ± 10.18	(30-65)
Weight (Kg)	83.45 ± 13.87	(49-148)
Size (m)	1.69 ± 0.69	(1.50-1.89)
Cholesterol	186.33 ± 57.77	(100-400)
Triglycerides	202.55 ± 92.66	(100 - 600)
	F	**(%)**
BMI (Kg/m)^2		
Normal weight	31	(15.0)
Overweight	107	(51.9)
Overweight	51	(24.8)
Obesity grade I	9	(4.4)
Obesity grade II	8	(3.9)
Obesity grade III		
Smoking		
Smoke or smoked in the past	89	(43.2)
No smoking	117	(56.8)

Note: X= Mean; SD= Standard Deviation; IQR= Interquartile Range; F= Frequency; (%) = (Percentage); Kg = Kilogram; M^2 = Meter squared.

For the erectile dysfunction study, the IEEF-5 test was used, with Cronbach's alpha of 0.73. Erectile dysfunction was present in 47.5%(n=98) of the total population surveyed, with mild ED being predominant (Figure 1).
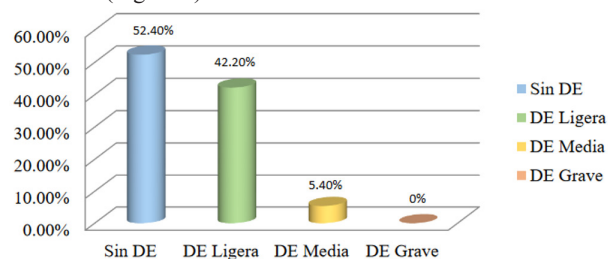

Figure 1 Erectile dysfunction.

Degrees of erectile dysfunction in patients of the outpatient clinic of HGZ/MF No.2 (n= 206). Note: (%) = Percentage; SD= Erectile Dysfunction.

The age group 51 to 60 years was the one that mainly presented some degree of erectile dysfunction, with mild being the most frequent, followed by medium (Figure2).
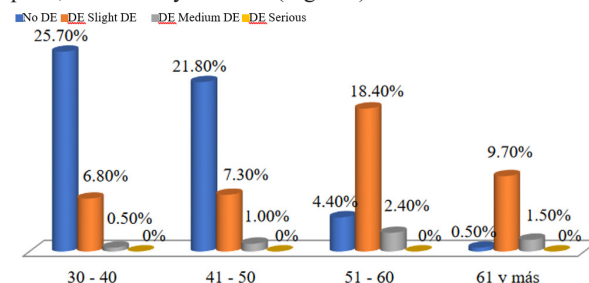

Figure 2 Erectile dysfunction by age group.

Age groups (years)

Degree of erectile dysfunction by age group of patients in the outpatient clinic of HGZ/MF No.2 (n=206).

Note: Chi^2 46.992, gl 6, p<0.001; *Statistically significant figure (p<0.05); (%) = Percentage; SD = Erectile Dysfunction.*

Table 2 and 3 show the risk factors studied based on the degree of erectile dysfunction, finding an association between the degree of dysfunction and smoking, arterial hypertension, diabetes mellitus, BMI and physical activity.

Table 2 Dyslipidemia, arterial hypertension and diabetes mellitus in relation to dysfunction. erectile dysfunction in outpatients at HGZ/MF No.2 (n=206).

Degree of Erectile Dysfunction

Variable	No DE	Slight	Media	Serious	p. Value
	F (%)	F (%)	F (%)	F (%)	
Dyslipidemia					0.213
Yes	43 (20.9)	42 (20.4)	7 (3.4)	-	
No	65 (31.6)	45 (21.8)	4 (1.9)	-	
PA Stadium					<0.001*
Normal	50 (24.2)	21 (10.2)	2 (1.0)	-	
Normal	2 (1.0)	4 (1.9)	-	-	
high Grade	43 (20.9)	24 (11.6)	3 (1.5)	-	
I	13 (6.3)	37 (18.0)	6 (2.9)	-	
Grade 2	-	1 (0.5)	-	-	
Hypertensive					
DM					<0.001*
Yes	94 (45.7)	55 (26.7)	6 (2.9)	-	
No	14 (6.8)	32 (15.5)	5 (2.4)	-	

*Chi^2 ;*Statistically significant figure (p <0.05); F (%) = Frequency (Percent); BP= Blood Pressure; DM= Diabetes Mellitus; ED= Erectile Dysfunction.*

Table 3 Smoking, BMI, and physical activity in relation to erectile dysfunction in patients from HGZ/MF No.2 outpatient clinic (n=206)

Degree of erectile dysfunction

	No DE	Slight	Media	Serious	p. Value
	F (%)	F (%)	F (%)	F (%)	
Smoking Smokes or smoked in the past	59 (28.6)	25 (12.1)	4 (2.0)	-	0.001*
Non-smoker	49 (23.8)	62 (30.1)	7 (3.4)	-	
BMI					0.002*
Normal weight	20 (9.7)	10 (4.9)	1 (0.5)	-	
Overweight	58 (28.1)	44 (21.4)	5 (2.4)	-	
Obesity I	26 (12.6)	24 (11.7)	1 (0.5)	-	
Obesity II	4 (1.9)	4 (1.9)	1 (0.5)	-	
Obesity III	-	5 (2.4)	3 (1.5)	-	
Physical activity					< 0.001*
Yes	50 (24.3)	5 (2.4)	2 (1.0)	-	
No	58 (28.1)	82 (39.8)	9 (4.4)	-	

*Chi^2 ;*Statistically significant figure (p <0.05); F (%) = Frequency (Percent); BMI= Body Mass Index; ED = Erectile Dysfunction.*

Depression was present in 38.40% (n=79) of the population, with mild depression being the most frequent in mild ED. The results are reliable, presenting a Cronbach's alpha of 0.88 (Figure 3).
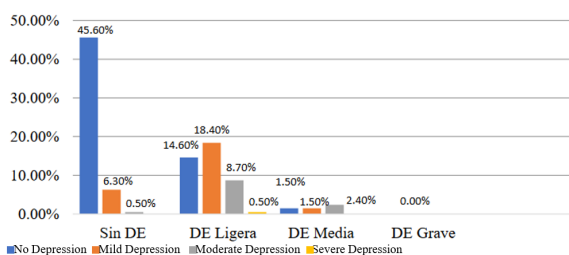

Figure 3 Depression based on the degree of Erectile Dysfunction (n=206).

Note: Chi2 25.612, gl 4, p<0.001; *Statistically significant figure (p<0.05); (%) = Percentage; No ED=No erectile dysfunction; ED=Erectile dysfunction.*

Depression by degrees of erectile dysfunction

Discussion

Erectile dysfunction (ED) represents a health problem that significantly affects the quality of life (QOL) in men worldwide, with individual, family, psychological and sexual affection. Several risk factors have been implicated, such as age, age, gender, age, sex, and smoking, dyslipidemia, arterial hypertension, diabetes mellitus, etc. Erectile dysfunction in young adults remains an understudied subject.

In the present study, a total of 206 male patients between 30 and 65 years of age, assigned to the Hospital General de Zona con Medicina Familiar No.2, 129 (62.62%) suffered from arterial hypertension and 76 (36.89%) from type 2 diabetes mellitus were analyzed. Erectile dysfunction was present in 98 (47.5%) of the total population surveyed, with mild erectile dysfunction being the most prevalent in 87 (42.22%) subjects, followed by medium in 11 (5.3%). The age range where ED was most prevalent was 51 to 60 years with 20.8%, while Sandoval Salinas C et al.,[21] in a study conducted in Colombia (2020) to 2613 patients, found that mean ED predominates in 37.6%, with mean age range of 48.7 years, results partially analogous to ours, however, their study was conducted in clinics specializing in male sexual health which justifies a higher percentage of prevalence of male patients with such diagnosis. In relation to the results of Jáuregui Vélez DI et al.,[22] in a study conducted in Tijuana, Mexico (2021) of 286 young people aged 18 to 35 years with a diagnosis of ED, the most frequent age group was 18 to 23 years (40%), results different from ours, possibly because their participants were exclusively patients with a diagnosis of ED, unlike ours, which was conducted in an open population.

The results obtained show that erectile dysfunction is related to HAS stage I (13.2%) and stage II (20.9%), as well as in uncontrolled diabetic patients (29.6%). Regarding BMI, overweight (23.8%) and grade 1 obese (12.2%) patients have a higher prevalence of erectile dysfunction, as well as patients who do not engage in physical activity (44.2%). Ramos Silva J et al.,[23] in their research conducted in August 2020 to January 2021, to 143 male patients aged 45 to 65 years old in Nacozari, Sonora, indicated the multiple associated comorbidities, determining that in patients with arterial hypertension erectile dysfunction was present in 37.1%, in those with uncontrolled type 2 diabetes mellitus in 28.7%, while in patients with dyslipidemia it covered 23.8% of the population and only 10.5% of patients with overweight and obesity. The results were partially similar to ours, with the relationship between ED and HAS being most strongly associated, followed by the relationship with diabetic patients, as well as overweight.

In another study by Buendia Millan H et al.,[24] in the city of Nezahualcóyotl, State of Mexico, 192 diabetic patients reported that 53.7% of uncontrolled diabetics reported a higher frequency of mild erectile dysfunction (18.8%), compared to those controlled without erectile dysfunction. While Heras Méndez LZ et al.,[25] in the city of Obregón, Sonora, Mexico, who studied the frequency and time of evolution of erectile dysfunction in patients with type 2 diabetes mellitus, obtained a 43.3% percentage of patients with uncontrolled comorbidity, with a lower figure than ours, possibly due to the size of the sample used. Espinosa Marrón A et al.,[26] studied a group of 86 Mexican men in Mexico City aged 30-60 years, who were classified into two groups according to the diagnosis of positive (70.9%) or negative (29.1%) metabolic syndrome; finding an association between patients with erectile dysfunction and metabolic syndrome, compared to patients with normal glucose metabolism, with results similar to ours.

Regarding the relationship between erectile dysfunction and depression in the present research study, depression was present in 38.40% of the population, where the relationship between ED and mild depression predominated in 26.20% followed by moderate depression in 11.70% and only 0.5% presented severe depression. On the other hand, Tesfay Gebremedhin H et al.,[27] in a study of 802 patients aged 18 to 60 years in the city of Adigraf in Ethiopia, found depression in 9.7% of the participants, being different from our study, possibly due to the association of chronic diseases and overweight, which decreases the quality of life and where depression is more prevalent. Yu Han F et al.,[28] in a study of 1740 Taiwanese men aged between 20 and 40 years, with a diagnosis of erectile dysfunction, found an association between symptoms of depression and erectile dysfunction, where 15.9% of men had moderate depression and 54.1% had severe depression, being more prevalent in those patients with moderate or severe erectile dysfunction, results similar to those of this research, where an association proportional to the degree of erectile dysfunction with the degree of depression was also found.

As limitations of our study, we consider the lack of inclusion of other variables such as socioeconomic level, marital status and medications used by the participants, as well as the quality of the sentimental relationships between partners, the veracity of communication with the partner and attitudes towards sexuality. These variables will allow us to understand erectile dysfunction in a comprehensive manner, so we suggest that in future research they be taken into consideration to expand the information at the time of data analysis.

Conclusion

The percentage of patients with erectile dysfunction seen in the family medicine outpatient clinic of the General Zone Hospital with Family Medicine No.2 in Zacapu, Michoacán, is high, hence the importance of ensuring adequate metabolic control in those with diabetes mellitus, arterial hypertension, dyslipidemia, overweight or obesity and depression, as well as to encourage physical activity due to the close relationship between sedentary lifestyle and the lack of control of comorbidities with the degree of erectile dysfunction in patients.

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Conflicts of interest

The author declares there is no conflict of interest.

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