Erektil Disfonksiyon Şikayeti ile Üroloji Polikliniğine Başvuran Hastalarda Kardiyovasküler Hastalıkların Değerlendirilmesi

The Evaluation of Cardiovascular Diseases in Patients Presenting to the Urology Outpatient Clinic with Erectile Dysfunction

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ÖZ

GİRİŞ ve AMAÇ: *Erektil disfonskiyon (ED) şikayeti olan hastalarda kardiyovasküler hastalık (KVH) riskinin değerlendirilmesi.*

YÖNTEM ve GEREÇLER: *Aralık 2018 ve Aralık 2019 tarihleri arasında ED sebebi ile başvuran 164 hasta prospektif olarak değerlendirildi. Bilinen KVH'ı olmayan bu hastalara kardiyoloji poliklinik konsültasyonu istendi. Hastaların aydınlatılmış onamı alındıktan sonra tansiyon arteriyel (TA), nabız, elektrokardiyografi (EKG), ekokardiyografi(EKO) bakıldı. Endikasyon dahilinde uygun hastalara koşu bandı egzersiz testi, miyokard perfüzyon sintigrafisi (MPS), koroner angiografi yapıldı*

BULGULAR: *Hastaların %25'inde KVH, %11.6'sında (n=19) angına tespit edildi. Yapılan efor testinde hastaların %9.8'inde (n=16) patolojik bulgular izlendi. Anginası olan ve miyokard perfüzyon sintigrafisi çekilen hastaların %7.3'ünde (n=12) iskemik alanlar izlendi. Hastaların %26.2'sine (n=43) koroner anjiografi yapıldı. Koroner angiografi yapılan hastaların % 30.23'ünde (n=13) korener arterlerde plak formasyonu izlendi. Hastaların %34.88'inde (n=15) left anterior descending (LAD), %11.62'sinde (n=5) right coronary artery (RCA), %4.65'inde (n=2) circumflex arter (Cx), %11.62'sinde (n=5) RCA ve LAD, % 6.97 (n=3) hastada ise LAD ve CX %80'nin üzerinde obstrüksiyon izlendi ve perkütan koroner stent uygulandı.*

TARTIŞMA ve SONUÇ: *ED sebebi ile başvuran hastalar, KVH erken teşhisi ve tedavisi için değerlendirilmelidir.*

Anahtar Kelimeler: *erektil disfonksiyon, kardiyovasküler hastalıklar, androloji.*

ABSTRACT

INTRODUCTION: *To evaluate the risk of cardiovascular disease (CVD) in patients with erectile dysfunction (ED).*

METHODS: *One hundred sixty-four patients presenting due to ED between December 2018 and December 2019 were evaluated prospectively. Cardiology clinic consultations were requested for these patients with no known CVD. Following receipt of informed consent, patients' arterial blood pressure, heart rate, electrocardiography, and echocardiography were investigated. Suitable patients also underwent the treadmill exercise test, myocardial perfusion scintigraphy, and coronary angiography, as indicated.*

RESULTS: *CVD was detected in 25% of patients, angina being found in 11.6% (n=19). Pathological findings were observed in 9.8% (n=16) of patients at the effort test. Ischemic areas were detected in 7.3% (n=12) of patients with angina and undergoing MPS. Coronary angiography was performed on 26.2% (n=43) of patients. Plaque formation was observed in the coronary arteries of 30.23% (n=13) of patients who underwent coronary angiography. Obstruction was observed in the left anterior descending artery (LAD) in 34.88% (n=15) of patients, in the right coronary artery (RCA) in 11.62% (n=5), in the circumflex artery (Cx) in 4.65% (n=2), in the RCA and LAD in 11.62%, and in the LAD and Cx in 6.97% (n=3), and percutaneous coronary stents were installed.*

DISCUSSION AND CONCLUSION: *Patients presenting with ED must be evaluated for early diagnosis and treatment of CVD.*

Keywords: *erectile dysfunction, cardiovascular diseases, andrology*

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INTRODUCTION

Erection occurs through coordinated functioning of the smooth muscle of cavernous tissue by endocrinological, neurological and vascular components together. Arterial dilation, smooth muscle relaxation, and the activation of veno-occlusive mechanisms are required for erection (1). Erectile dysfunction (ED) is defined as the inability to achieve and maintain an adequate and satisfactory erection (2). In addition to its effects on the partners ınvolved, ED may also be an early indicator of coronary artery and peripheral vascular diseases (3,4).

Studies have reported a prevalence of 52% among men aged 40-70, with rates of mild, moderate and severe ED of 17.2%, 25.2%, and 9.6%, respectively (3). Another study reported a prevalence of ED of 19.2% in men aged 30-80, and that the frequency increased with age (4). A study from Turkey reported a prevalence of 69.2%, with a prevalence of moderate and severe ED constituting a risk for cardiovascular disease (CVD) of 36% (5).

Smoking, obesity, CVD, diabetes mellitus (DM), dyslipidemia, metabolic syndrome, and a sedentary lifestyle have all been implicated in the etiopathogenesis of ED (6,7). Age, duration of existing chronic diseases, body mass index (BMI), obstructive sleep apnea syndrome, vitamin D deficiency, and hepatitis B are also associated with ED (8-11).

There are three types of ED, organic, psychogenic, and mixed (12). Vascular, neurogenic, anatomical, hormonal, drug-related or psychogenic causes may be involved in the pathophysiology of ED (13). ED by itself may be an indication of CVD, and studies have also reported a link between ED and CVD (14-16).

ED can appear 3-5 years before symptoms of CVD (17). Risk classification in terms of CVD and exercise capacity is recommended in the assessment and treatment of patients with ED (18,19).

The aim of the present study was to investigate the feasibility of ED in predicting CVD in individuals presenting to our outpatient clinic due to ED and with no known CVD.

MATERIAL AND METHOD

This study was performed in conformity with the ethical standards set out in the Declaration of Helsinki and after local ethical committee approval (2018 / 17-157). One hundred sixty-four patients with no previous presentations to our clinic due to ED and scoring 21 or less on the International Index of Erectile Function (IIEF) questionnaire between December 2018 and December 2019 and agreeing to cardiology clinic consultations were included in the study. Informed consent was received from all patients. The study was designed prospectively.

Histories were taken from patients, and detailed physical examinations were performed. Demographic information was recorded. Patients' lipid profiles, fasting blood sugar (FBS), creatinine clearance, HbA1C, FSH, LH, prolactin, total testosterone, TSH, and T4 values were investigated. Patients with a known history of drug use, diagnosed wıth chronic disease (such as DM and congestive heart failure), with histories of major pelvic surgery, with neurological or psychogenic disease, or with anatomical or hormonal disorders were excluded.

Cardiology consultations were requested for the patients enrolled in the study. Arterial blood pressure, heart rate, electrocardiography (ECG), and echocardiography (ECO) were investigated in patients undergoing cardiac evaluation, and the treadmill exercise test, myocardial perfusion scintigraphy (MPS), and coronary angiography were applied to suitable patients as indicated.

Statistical analysis

Statistical Package for the Social Science (SPSS) v20 for Windows software was used for entering and analyzing the research data. Categorical variables were expressed as number and percentage, and numerical variables as mean plus standard deviation. Suitability for analysis of numerical variables was investigated using the Kolmogorov-Smirnov test. The Mann-Whitney U test was used in the comparison of numerical variables. p values <0.05 were regarded as statistically significant.

RESULTS

The mean age of the patients in the study was 52.01±5.48 years, and their mean BMI was 26.27±3.54 kg/m2 (Table 1). In terms of education, 8.5% (n=14) of patients were elementary school

graduates, 17.1% (n=28) were high school graduates, and 74.4% (n=122) were university graduates. A history of smoking was present in 16.5% (n=27) of patients (Table 2).

Severe ED was observed in 10.4% of patients, moderate ED in 15.2%, and mild-moderate ED in 74.4% (Table 2).

Blood lipid profile analysis revealed LDL levels of 115±4327.59 mg/dl, TG levels of 146.53±84.06 mg/dl, total cholesterol levels of 171.79±37.57 mg/dl, and HDL levels of 39.99±6.70 mg/dl (Table 1).

Table 1. Patient's demographic, biochemical, and clinical characteristics

	Mean±SD	Median (Minimum-Maximum)
Age (years)	52.01±5.48	53.0 (40.0-60.0)
BMI (kg/m^2)	26.27±3.54	26.0 (20.0-38.0)
LDL (mg/dl)	115±4327.59	114.50 (58.0-213.0)
HDL (mg/dl)	39.99±6.70	39.33 (20.64-60.22)
Cholesterol (mg/dl)	171.79±37.57	170.5 (99.0-410.0)
Triglyceride (mg/dl)	146.53±84.06	127.0 (42.0-757.0)
FBS (Fasting Blood Sugar) (mg/dl)	90.03±8.18	89.0 (72.0-124.0)
HbA1c (%)	5.30±0.21	5.3 (5.0-5.7)
Systolic tension	114.45±12.88	110.0 (90.0-160.0)
Diastolic tension	68.93±11.33	67.5 (55.0-110.0)
Duration of ED (years)	2.26±1.58	2.0 (1.0-8.0)
EF (%)	58.61±3.81	58.61 (50.0-69.0)

BMI: Body mass index, LDL: Low-density lipoprotein cholesterol, HDL: High-density lipoprotein cholesterol, ED: Erectile dysfunction, EF: Ejection fraction

Patients mean HbA1c value was 5.30±0.21. A family history of diabetes was present in 6.1% (n=10) of patients, and a family history of CVD in 16.5% (n=27). Mean systolic blood pressure was 114.45±12.88 mm/Hg and mean diastolic blood pressure was 68.93±11.33 mm/Hg (Table 1).

Mean ejection fraction (EF) at ECO was 58.61%±3.81. Mitral insufficiency was also detected in 1.8% (n=3) of patients, aortic insufficiency in 2.4% (n=4), and tricuspid insufficiency in 2.4% (n=4). CVD was determined in 25.0% (n=41) of patients, and peripheral artery disease in 1.8% (n=3). Angina was detected in 11.6% (n=19) of patients, stable angina in 36.8% and unstable angina in 63.2%. Pathological findings were observed at exercise tests in 9.8% (n=16) of patients. Ischemic areas were observed in 7.3% (n=12) of patients with angina and undergoing MPS (Table 2).

Table 2. Classifications of patients based on history and CVD evaluations

	n	%
Education		
Elementary	14	8.5
High school	28	17.1
University	122	74.4
Smoking status		
Smokers	27	16.5
Non-smokers	137	83.5
ED severity		
Severe	17	10.4
Moderate	25	15.2
Mild-moderate	122	74.4
Family history of CVD		
Yes	27	16.5
No	137	83.5
Family history of diabetes		
Yes	10	6.1
No	154	93.9
Angina status		
Stable angina	7	4.3
Unstable angina	12	7.3
Peripheral artery disease		
Yes	3	1.8
No	161	98.2
Coronary artery disease		
Yes	41	25.0
No	123	75.0
Echocardiography findings		
Mitral insufficiency Aortic insufficiency Tricuspid insufficiency	3 4 4	1.8 2.4 2.4
Coronary angiography		
Performed	43	26.2
Not performed	121	73.8
Myocardial Perfusion Scintigraphy		
Ischemia	12	7.3
Patients with pathology at effort tests	16	9.8

ED Erectile dysfunction, CVD Cardiovascular disease

Coronary angiography was performed in 26.2% (n=43) of patients. Plaque formation or slow flow were observed at angiography in the coronary arteries in 30.23% (n=13) of patients, and medical treatment was initiated. Obstruction exceeding 80%

was observed in the left anterior descending (LAD) artery in 34.88% (n=15) of patients undergoing percutaneous coronary intervention, in the right coronary artery (RCA) in 11.62% (n=5), in the circumflex artery (Cx) in 4.65% (n=2), in the RCA and LAD in 11.62% (n=5), and in the LAD and Cx in 6.97% (n=3), and percutaneous stents were installed (Table 2).

Duration of ED in patients undergoing coronary angiography was 4.06±1.68 years, compared to 1.61±0.90 years in those not undergoing coronary angiography. Duration of ED was significantly longer in patients with indications for percutaneous coronary angiography ($p < 0.001$).

DISCUSSION

ED is a frequently seen disease, the incidence of which increases with age (3). Smoking, obesity, CVD, DM, dyslipidemia, metabolic syndrome, and a sedentary lifestyle are all implicated in the etiopathogenesis (6,20). CVDs are known to be among the most important causes of organic ED (20). Indeed, since CVD and ED share the same etiologies (DM, hypertension, hyperlipidemia, smoking etc.) the two conditions are generally seen together (21).

The cavernosal arteries in the penis contain a dense endothelial and muscle layer. This makes the penis susceptible to oxidative stress. Systemic CVDs lead to an impairment of the synthesis of nitric oxide (NO) that exhibits a vasodilator effect as a cause of endothelial damage. This causes impairment of the first stage of erection and causes ED (22,23). Virag et al. reported that a decreased penile arterial flow at arterial Doppler imaging was associated with atherosclerosis (24).

The small size of the penile cavernosal arteries and their dense endothelial content gave rise to the idea that ED may be a potential marker in terms of CVD. One study investigated C-reactive protein (CRP), an indicator of endothelial damage that increases in CVDs, in patients presenting due to ED and without CVD, and reported that an increase in CRP was associated with severity of ED [25]. Another study compared patients resenting due to ED and with no history of CVD with healthy individuals and reported a decreased brachial artery flow rate in patients with ED (26). There is evidence that the presence of ED increases subsequent CVD-related mortality, and myocardial infarction (MI) and CVDs (27). The present study evaluated the relationship between ED and CVD and sought to prevent subsequent mortality.

Studies have reported that patients presenting with ED represent a high risk group in terms of CVD and that CVD has been identified following advanced tests (24,28). The ED patients in the present study were tested for CVD and, as shown in Table 2, a high rate of cardiac pathologies was detected.

Vlachopoulos et al. reported positive stress tests in 24% of 50 patients presenting due to ED and with no history of CVD. ED patients were identified as exhibiting CVD risks (smoking, hyperlipidemia, and hypertension), and coronary angiography was performed on 10 patients. Three arterial diseases were detected in one of these patients, two arterial diseases in two, and a single arterial disease in six (29). Tunç et al. determined acute atherosclerotic heart disease in 28% of patients presenting due to ED and with no history of CVD, coronary bypass being indicated in three, and the risk of CVD being observed to increase with age (30). Imprialos et al. reported that CVDs generally developed 3-5 years after ED, and that ED allows time to be gained in the management of CVD and the taking of appropriate precautions (31). CVD was determined in 25% of patients in the present study. Pathological findings were observed at effort tests in 9.8% of patients, and coronary angiography was performed on 26.2%. Arterial plaque formations were observed in 30.23% of patients undergoing coronary angiography, with obstruction in more than 80%, in the LAD in 34.88%, in the RCA in 11.62%, in the Cx in 4.65%, in the RCA and LAD in 11.62%, and in the LAD and Cx in 6.97%.

CONCLUSION

In conclusion, ED is a frequently seen disease that occupies an important place in urological practice. When patients were investigated and advanced tests performed despite no history of CVD generally being present, the great majority are found to be at risk of CVD and to have coronary artery disease. We think that patients presenting due to ED should also be evaluated in terms of CVD

and that cardiology clinic consultations should be requested**.**

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