

Erectile Dysfunction in Subjects with Diabetes: Role of the Internist

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Introduction:

Erectile dysfunction (ED) can be defined as the persistent inability to achieve or maintain penile erection sufficient for satisfactory sexual performance. (1) ED can have a profound negative effect on the quality of life of patients and their families. (2)

The association between diabetes mellitus and ED has been documented since 1798.

(3) Generally 25–85% of men with type 2 diabetes mellitus (T2DM) complain of ED.

(4) The exact prevalence of ED is largely unknown in Arab countries including Egypt; many patients in the Arab world don't seek medical advice because of the traditions which prohibit open discussion of sexuality.(5) However, a one cross sectional study found that 80% of Egyptian subjects with T2DM reported some degree of ED.(6) Another study of 562 males with T2DM in Saudi Arabia reported that 86% had various degrees of ED.(7)

There are many risk factors for ED in subjects with diabetes (Table 1), the association between obesity and ED may be explained by conversion of testosterone to β -oestradiol via aromatase activity in the adipose tissue. (8) During the last COVID pandemic; it was found that COVID-19 exerts a detrimental effect on male reproductive function, including erectile function. (9)

ED has been shown to be significantly associated with all-cause mortality and cardiovascular events.(10) Given that the arterial vasculature of the penis is much

smaller than other vessels (such as coronary arteries), ED often precedes cardiovascular disease (CVD) and is recognized as a warning sign of occult CVD.(11)

Many structural and functional abnormalities are involved in the pathogenesis of ED in subjects of diabetes including; impaired relaxation of cavernosal SM, decreased sensory impulses from penis and impaired blood flow to penis (Figure 1). (11)

Assessment for ED:

Screening for ED in men with diabetes should begin at diagnosis of diabetes; all adult men with diabetes should be regularly screened for ED with a sexual function history (table 2).(10,12) Taking detailed drug history is critical as some medications may exacerbate ED in men with diabetes including β -blockers (with exception of nebivolol), thiazide diuretics and aldosterone receptor antagonists.(8)

Management of ED:

The management of ED starts with lifestyle changes and risk factor modifications that includes losing weight, physical exercise, reducing alcohol intake, avoiding smoking and optimal glycemic, lipid and blood pressure control. (13,14)

Oral phosphodiesterase type 5 inhibitors (PDE5i) are the first-line treatment for ED that can be easily prescribed by internist or the primacy care physician dealing with males with diabetes and ED as these drugs

have the advantages of high efficacy, safety and non-invasiveness. (13) Between 60% and 65% of men with ED can successfully complete intercourse in response to the PDE5i (table 3). (12,15)

Of the patients that initially do not respond to PDE5i, between 30 and 50% may be converted to responders by counselling the patient and his partner (table 4). (16,17) It is important to understand that PDE5i do not cause automatic erections as they require a minimum level of nitric oxide (NO) to function. (18)

Diabetic males who don't respond to PDE5i should be screened for hypogonadism; cases who are negative for hypogonadism should then be referred to an ED specialist. (10)

Contraindications for PDE5i include concomitant use of nitrates and unstable angina or untreated cardiac ischemia. (10) PDE5i are both effective and safe in hypertensive patients and hypertension is not a contraindication for PDE5i. (19)

Second-line therapies for ED include vacuum constriction devices, intracorporal injection therapy with prostaglandin E1 (alprostadil) alone or in combination with papaverine and phentolamine and intraurethral therapy using alprostadil. (10)

As a third line therapy, penile prosthesis may be considered, however, men with diabetes seem to be more prone to developing prosthesis infections. (8,10)

Conclusion:

The role of internists regarding ED in males with diabetes include three main tasks, (1) ASK all their patients regarding sexual life, (2) EDUCATE their patients regarding ED

and (3) HELP their patients to restore and enjoy satisfactory sexual life.

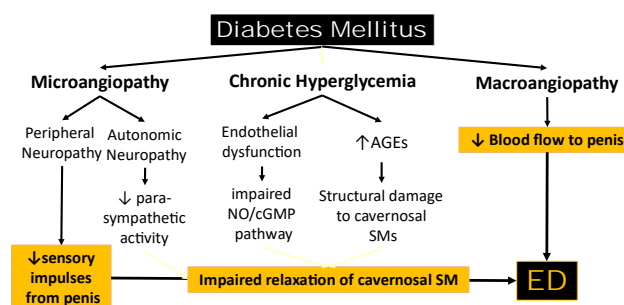


Figure (1): Pathogenesis of erectile dysfunction in diabetes mellitus.

AGEs: advanced glycation endproduct, NO: nitric oxide, SM: smooth muscle, cGMP: Guanosine 3',5'-cyclic monophosphate.

Table 1: Risk Factor for ED: (8,9)

<ul style="list-style-type: none"> • Increasing age. • Duration of diabetes. • Poor glycemic control. • Cigarette smoking. • Sedentary lifestyle. • Obesity. • Obstructive sleep apnea. • Hypertension & dyslipidemia. • Cardiovascular disease. 	<ul style="list-style-type: none"> • Androgen-deficiency states. • Depression. • Lower urinary tract infection. • Benign Prostatic Hyperplasia. • Recent COVID-19 infection.
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Table 2: Assessment of ED (10,12)

Sexual function history: <ul style="list-style-type: none"> • Onset of ED (sudden or gradual?) • Morning erections? • Libido (Desire)? • Psychosocial factors? • Relationship problem(s)? • Social stressors? • Drug history? • Response to treatment? • Ejaculation disorder? Pre-mature ejaculation? 	Laboratory investigations: <ul style="list-style-type: none"> • Glycemic profile. • Lipid profile. • TSH. • Morning total testosterone (08.00–11.00 am). • Luteinizing hormone. • Serum prolactin.
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Table 3: Phosphodiesterase type 5 inhibitors (PDE5i) (15)

	FDA Approved Dosing	Onset of Action	Half-Life	Absorption
Sildenafil	25–100 mg oral on-demand	60 min	3–5 hour	Slowed by food
Vardenafil	5–20 mg oral on-demand	30 min	4–6 hour	Slowed by food
Tadalafil	5–20 mg oral on-demand 2.5–5 mg daily dose	60-120 min	17.5 hour	Not affected by food

Table 4: Checklist to ensure appropriate usage of PDE5 Inhibitors:

<ul style="list-style-type: none"> • Need of sexual stimulation. • Time to have an effect. • Maximum dose adjustment. • Food and alcohol effects in some PDE5i. • Trial of different PDE5i. • Review of concomitant medications affecting erections. • Hypogonadism recognition.

Conclusion:

The role of internists regarding ED in males with diabetes include three main tasks, (1) ASK all their patients regarding sexual life, (2) EDUCATE their patients regarding ED and (3) HELP their patients to restore and enjoy satisfactory sexual life.

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