Sexual problems in diabetes

Eleanor Holloway

Abstract

Diabetes mellitus causes sexual dysfunctions via autonomic neuropathy and endothelial dysfunction in the genitals, and via its effects as a chronic disease on the individual's global health and well-being. The most commonly complained of sexual dysfunction associated with diabetes is erectile dysfunction (ED), experienced by 35–90% of men with diabetes. It is increasingly recognized that the multiple factors causing ED in men also affect sexual function in women. In a recent study, 44% of women with type 1 diabetes and 25% with type 2 diabetes had a sexual dysfunction, but diabetic women complain of problems with sex much less often than diabetic men. The success of Viagra brought ED into the social and medical limelight; loss of arousal and therefore desire in women is a more multifactorial, and less visible, problem.

Keywords Autonomic neuropathy; endothelial dysfunction; erectile dysfunction; MRCP; sexual dysfunction; testosterone

Key points

- People of all genders with diabetes have an increased risk of sexual dysfunction
- Enquiry about sexual dysfunction should be part of routine diabetic care
- There are a variety of treatments for erectile dysfunction

Introduction

Sexual dysfunction affects both men and women with diabetes. Around 35–90% of men with diabetes experience erectile dysfunction (ED).[1] In a recent study, 44% of women with type 1 and 25% with type 2 diabetes mellitus had a sexual dysfunction (see Ahmed et al., Further reading). People with type 1 diabetes with a sexual dysfunction have been found to have a lower quality of life and greater psychological distress.

The pathophysiology of sexual dysfunction in diabetes is multifactorial.[2] Diabetes causes autonomic neuropathy affecting the nerve supply to the genitals that controls arousal. It also causes vascular disease, disrupting the blood flow to the genitals in arousal: nitric oxide produced by the vascular endothelium mediates the smooth muscle relaxation that allows increased blood flow into the genitals during arousal. Low testosterone levels are more common in men with diabetes – these can cause reduced libido and ED, as well as low mood.

Diabetes is a chronic disease, and the associated stress of long-term symptoms, medical appointments, investigations and daily treatments can affect sexual function via the person's mood, anxiety levels, fatigue and general well-being. People with diabetes can have co-morbidities of hypertension, hyperlipidaemia, cardiovascular disease or other endocrine dysfunction, and these, and their associated treatments, can affect sexual function. And of course people with diabetes, like the general population, have sexual dysfunctions that may not be uncovered until a change of health status brings the problem to light – the sexual dysfunction may pre-date the diabetes. The longer the duration of diabetes and the older the patient, the more likely they are to have a sexual dysfunction (see Bak, Further reading).

Taking a sexual history

Sexual dysfunction is best raised directly and considered holistically. Enquiry about sexual dysfunction should be a routine part of longterm diabetic care, as enquiry about mood is (see Phillips, Further reading). Patients are more likely to raise the subject if given explicit permission to do so – 'Many people with diabetes find it affects their sex life. Is this something that has bothered you?' They may not immediately discuss the topic, but they have discovered that you can hear about sexual problems so they may bring this up in a future consultation.

A man with diabetes complaining of problems with sex is most likely to describe poor or no erections ('can't get it up/can't keep it up'). It is important to clarify the history and ask exactly when in the course of a sexual experience the problem lies, to distinguish ED from low libido (lack of interest in sex – which then leads to poor arousal and ED), premature ejaculation ('coming too quickly' – all men lose their erection after ejaculation) and delayed or absent ejaculation ('it takes ages/can't come' – an older man may not be able to sustain his erection long enough if climax is delayed). More than one of these problems can of course coincide.

Enquiry regarding symptoms of testosterone deficiency (fatigue, change in muscle mass, change in exercise tolerance, low mood, hot flushes, gynaecomastia) and lower urinary tract symptoms are relevant in men. It is also worth enquiring if a man's erections are straight or have become curved – this can identify Peyronie's disease, a cause of ED. Peyronie's disease affects a small percentage of the general male population but is more common in men with diabetes.

For women with diabetes, the physiological equivalent of ED is poor arousal – lack of vaginal lubrication and vaginal expansion, and absent clitoral and labial swelling. Woman rarely complain of 'poor arousal' when presenting with sexual dysfunction – they more often complain of low libido, painful sex or difficulty reaching orgasm. In long-term relationships, female libido is often responsive – it follows rather than precedes the beginning of arousal, so poorer physiological arousal often presents as lower interest in sex (see Basson, Further reading).

A menstrual history, particularly the age of menopause in older women, is useful, as the sexual effects of menopause overlap with those of diabetes.

Eleanor Holloway *BA BM BCh DFSRH PGDip Relationship Therapy – Psychosexual is a Speciality Doctor in Sexual Health and Psychosexual Therapist at Oxford University Hospitals NHS Foundation Trust, UK.*
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In all patients, a general sexual history is essential to evaluate sexual dysfunction in context. This should include historical child sex abuse, previous sexual assault, sexual function in previous relationships, length of the current relationship and sexual function earlier in the current relationship — when did it change?, what was going on at that time? Is the dysfunction global (alone and with any partner) or situational (only with partner(s))? What does the patient think the cause of the problem is, and what have they tried so far to help? What is the quality of the relationship with their partner(s) outside the bedroom? Do they have children? Do they wish to conceive?

Examination

Men should have a genital examination to check for penile abnormality, normal genital skin, testicular presence and volume.

Women complaining of painful sex should have a pelvic examination to exclude genital dermatology, including postmenopausal atrophy, and rule out gynaecological causes of dyspareunia.

ED is an independent risk factor for cardiovascular disease, so confirm the patient has had recent checks of blood pressure, weight, smoking status, lipids and glycaemic control, as well as an appropriate cardiovascular system risk assessment.

Investigation

For men, a 9 am testosterone concentration should be measured on two occasions at least a week apart. If testosterone is low then check gonadotrophins, to characterize the hypogonadism, and sex hormone-binding globulin (SHBG). Prolactin and thyroid-simulating hormone (TSH) should be checked as hyperprolactinaemia and throid imbalance can cause sexual dysfunction. Lipids and glycated haemoglobin (HbA_{1c}) should also be measured for cardiovascular risk assessment.[3] In women two follicle-stimulating hormone (FSH) measurements should be taken, 6 weeks apart, if menopausal status is in question. Also consider measuring prolactin, TSH, lipid and HbA_{1c} concentrations.

Sex is exercise so, like other forms of exertion, it can be associated with an increased risk of cardiovascular events. International guidelines therefore recommend cardiac risk stratification, and further cardiac evaluation of high-risk patients, before undertaking treatment to restore sexual function in men.[4] No equivalent guideline exists for women, but women with diabetes also have increased cardiovascular risk. For the pragmatic clinician, the following guideline is useful: intercourse is equivalent to briskly climbing two flights of stairs in 10 seconds, walking 1 mile on the flat in 20 minutes, or 4 minutes of the Bruce treadmill protocol (see Nehra et al. Further reading).

Treatment

Phosphodiesterase type 5 inhibitors (PDE5Is) are the first-line treatment for ED in all men as long as there are no contraindications (Table 1). All PDE5Is rely on adequate sexual stimulation to work as, by inhibiting the breakdown of cyclic guanosine monophosphate (cGMP), they potentiate the nitric oxide-mediated smooth muscle relaxation that allows blood flow into the erectile tissue (Figure 1).

Men with diabetes often report that PDE5Is helped their ED at first and then became ineffective. This is the result of a progression of autonomic neuropathy and endothelial dysfunction preventing adequate nitric oxide release — if the chemical chain of events in the penis is not started off, the PDE5I cannot potentiate it. It is worth explaining this mechanism of action to men. It also helps to explain why the tablets will not work if they do not participate in adequate arousing sexual activity — and why if they get struck by performance anxiety because of their now regular experience of failing erections, the parasympathetic drive to arousal will drop, along with their erection.

When PDE5Is do not, or no longer, work, alternative ED treatments include:

- vacuum pump devices (to be used with a constriction ring that can stay on for up to half an hour), which can create an erection is almost all men, although their successful use depends on careful teaching of pump use and acceptability to the couple
- alprostadil — as a cream, intraurethral pellet or intracavernosal injection
- combination intracavernosal injection of, for example, aviptadil plus phentolamine mesilate
- penile implants — the third- or fourth-line treatment, after medical treatments have failed, as they permanently destroy the natural erectile tissue.

The fact that sildenafil has not gained a licence for treatment of sexual arousal disorders in women underlines the fact that the data are conflicting, with no clear benefit to definable groups of women. An imaging study has shown no greater action of sildenafil over placebo in increasing clitoral engorgement. For women dealing with poor libido, poor arousal, painful sex secondary to these and difficulty climaxing, a combination of physical and psychological advice is optimal. Transdermal testosterone also has no licence for use in women, although it is sometimes used off-licence to treat low libido in women.

Postmenopausal women may benefit from vaginal oestrogen replacement by cream, pessary or vaginal tablet; this is rarely contraindicated, even if systemic hormone replacement therapy is. A non-hormonal alternative is a vaginal moisturizer such as Replens, Regelle or Yes VM (designed to be used twice a week). Use of suitable lubricant is essential for any couple dealing with sexual dysfunction. The genital skin best tolerates unperfumed, non-coloured, paraben-free lubricants.

Discussion and understanding regarding the various factors contributing to difficulty with sex is the most helpful approach. Including the partner in this discussion often provides the missing pieces of the jigsaw. Underlying relationship difficulties usually need addressing before sex can improve. The couple should be referred or directed to relationship therapy if necessary. For many couples, a sexual dysfunction leads to avoidance and they may have not had any form of sexual intimacy for a long time (often years by the time they seek help). This avoidance leads to increased anxiety about sex, and the anxiety itself then causes or potentiates sexual dysfunction.

A graded approach to re-establishing physical intimacy works best. Self-help tools are available to help a couple with ideas for intimate non-sexual touching exercises. Psychosexual therapy can take a couple through a gradual process like this, with the therapist tailoring exercises to the couple and providing

Treatments for erectile dysfunction

Drug	Dose	How to take	Advice	Warnings
PDE5Is				
Sildenafil	25—100 mg	60 minutes before sex	Duration of action 4—6 hours	Best taken on an empty stomach or after a light meal Maximum of one dose in 24 hours	Check drug interactions — do not take concurrently with nitrates Beware α-adrenoceptor blockers for lower urinary tract symptoms, CYP3A4 inhibitors and other hypotensives
Vardenafil	10—20 mg	25—60 minutes before sex	Duration of action 4—6 hours	
Avanafil	50—200 mg	15—30 minutes before sex	Duration of action 4—6 hours	
Tadalafil	10—20 mg	At least 30 minutes before sex	Duration of action up to 36 hours	
	2.5—5 mg	Once a day, continuous	Background action	
Alprostadil				
Cream	300 micrograms	5—30 minutes before sex	Apply to the tip of the penis and rub in	Maximum once in 24 hours and three times per week Duration of erection should not exceed 1 hour	Clear instructions on what to do in the event of priapism are essential Not suitable if increased risk of priapism, e.g. myeloma, sickle cell disease
Intraurethral pellet	250—1000 micrograms	5 minutes before sex	Insert and then massage penis	
Intracavernosal injection	2.5—40 micrograms	5 minutes before sex Teaching of injection technique and test dose needed in clinic	Increase dose gradually to produce a satisfactory erection that lasts no more than 1 hour	
Aviptadil/ phentolamine	25/2000 micrograms	Teaching of injection technique and test dose needed in clinic		Maximum once in 24 hours and three times per week Duration of erection should not exceed 1 hour	Clear instructions on what to do in the event of priapism are essential Not suitable if increased risk of priapism, e.g. myeloma, sickle cell disease
Vacuum pump devices				Constriction ring can stay on for maximum of 30 minutes	
Penile implants				Irreversible destruction of natural erectile tissue	

Table 1

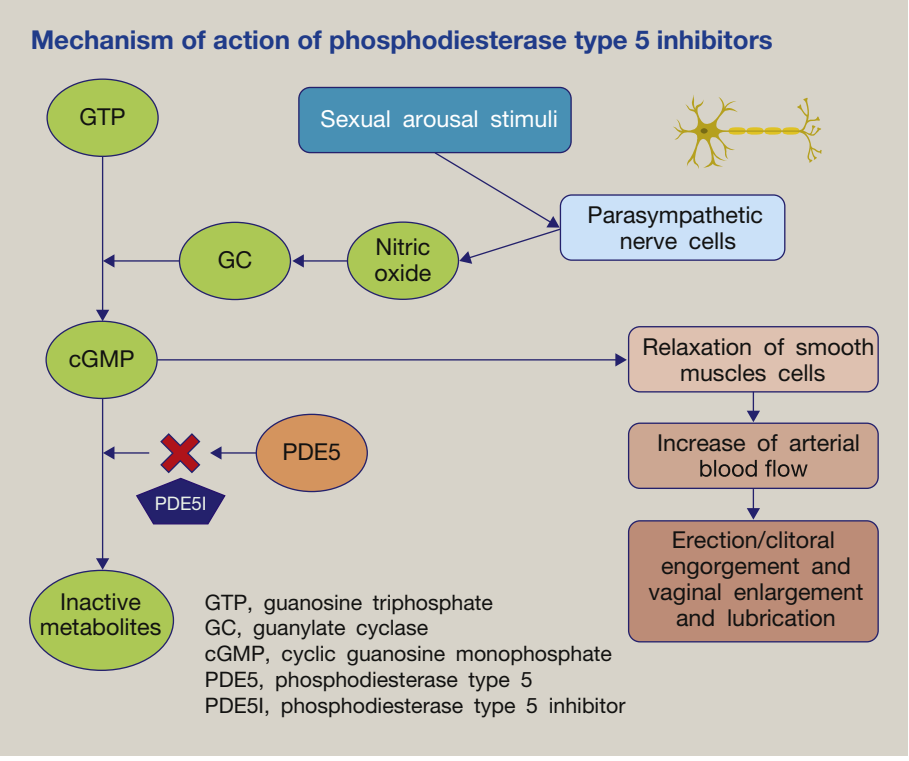

Figure 1

psychological formulations and help along the way. Psychosexual therapy can be very helpful when, for physical reasons, sex cannot get back to what it was like before. The couple may need to grieve for their previous sex life and work out how physical intimacy can be successful for them within current physical and medical restrictions. ◆

KEY REFERENCES

1 Malavige LS, Levy JC. Erectile dysfunction in diabetes mellitus. *J Sex Med* 2009; **6:** 1232–47.
2 Lue TF, Brant WO, Shindel A, Bella AJ. Sexual dysfunction in diabetes. In: De Groot LJ, Chrousos G, Dungan K, et al., eds. Endotext [online]. South Dartmouth, MA: MDText.com, 2000.
3 Hackett G, Kirby M, Wylie K, et al. British society for sexual medicine guidelines on the management of erectile dysfunction in men–2017. *J Sex Med* 2018; **15:** 430–57.
4 European Association of Urology. Male sexual dysfunction. https://uroweb.org/guideline/male-sexual-dysfunction/ (accessed Dec 2018).

FURTHER READING

Ahmed MR, Shaaban MM, Sedik WF, Mohamed TY. Prevalence and differences between type 1 and type 2 diabetes mellitus regarding female sexual dysfunction: a cross-sectional Egyptian study. *J Psychosom Obstet Gynaecol* 2017; **24:** 1–6. https://doi.org/10.1080/0167482X.2017.1318123.

Bąk E, Marcisz C, Krzemińska S, et al. Relationships of sexual dysfunction with depression and acceptance of illness in women and men with type 2 diabetes mellitus. *Int J Environ Res Public Health* 2017; **14:** 1073. https://doi.org/10.3390/ijerph14091073.

Basson R. Rethinking low sexual desire in women. *BJOG Int J Obstet Gynaecol* 2002; **109:** 357–63.

Nehra A, Jackson G, Miner M, et al. The princeton III consensus recommendations for the management of erectile dysfunction and cardiovascular disease. *Mayo Clin Proc* 2012; **87:** 766–78. https://doi.org/10.1016/j.mayocp.2012.06.015.

Phillips A, Phillips S. Recognising female sexual dysfunction as an essential aspect of effective diabetes care. *Appl Nurs Res* 2015; **28:** 235–8. https://doi.org/10.1016/j.apnr.2015.04.007.

TEST YOURSELF

To test your knowledge based on the article you have just read, please complete the question below. The answer can be found at the end of the issue or online here.

Question 1

A 59-year-old man presented with erectile dysfunction. He had had type 2 diabetes for 19 years. His body mass index was 39.

Which of the following is most likely to be an important mechanism underlying his problem?

A Increased nitric oxide in the blood vessel walls
B Sympathetic nerve dysfunction
C Reduced levels of follicle-stimulating hormone (FH) and luteinizing hormone (LH)
D Low levels of testosterone
E Increased levels of thyroxine