Fundamentals in diabetes. Part 4: Sexual dysfunction

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People with diabetes are more likely to have sexual dysfunction than the general population. The management of sexual dysfunction has dramatically changed in the past decade with the widespread use of pharmacological and physical options for men with erectile problems. There is now growing recognition of female sexual dysfunction, although there is little evidence of the efficacy of any treatment. Questions about sexual dysfunction should be part of routine diabetes assessment. This article, the fourth in a series exploring the pathophysiology of vascular complications in diabetes, provides an overview of the underlying mechanisms of sexual dysfunction and describes the treatment options.

Sexual dysfunction management in diabetes has dramatically changed in the past few years.

Male sexual dysfunction, or erectile dysfunction (ED), has been managed in recent years with very simple erectile therapies that can transform lives. There have been a number of studies which show that ED can affect between 35–90% of men with diabetes (Malavige and Levy, 2009). This problem increases with age, as the Massachusetts Male Aging Study showed (Feldman et al, 1994). In 2002, Dey and Shepherd found that men with diabetes have more than a three-fold increased prevalence of ED compared with non-diabetic men. It was estimated that the majority (around 80%) had ED due to organic not psychogenic causes (Price and Alexander, 2002).

Female sexual dysfunction (FSD) is something that has been widely recognised only in the past few years. It is known that one quarter of women with diabetes will experience some kind of sexual problems or loss of sexual desire as a result of diabetes and they are almost twice as likely to have FSD (Nowosielski et al, 2010).

Although not as common as ED, there is growing recognition that female sexual problems, collectively known as FSD, are widely experienced, especially in women with diabetes. The four main areas of sexuality that women find difficulty with are desire, arousal, pain with intercourse (dyspareunia) and orgasm.

In the recent EDIC (Epidemiology of Diabetes Interventions and Complications) study (Enzlin et al, 2009), researchers found that 35% of sexually active women with type 1 diabetes met criteria for FSD. Women with FSD reported loss of libido (57%); problems with orgasm (51%), lubrication (47%), and arousal (38%); and pain (21%). However, in a multivariate analysis of the EDIC data, only depression (P=0.004) and marital status (P=0.003) were significant predictors of FSD.

Article points

1 Although not as common as erectile dysfunction (ED), there is growing recognition that female sexual problems, known as female sexual dysfunction, are widely experienced, especially in women with diabetes.

2. Penile erection and female sexual function is predominantly a vascular event which occurs via the autonomic nervous system

3. ED is three times more common in men with diabetes and it tends to occur around 15 years earlier than in those without diabetes.

Key words

- Erectile dysfunction
- Female sexual dysfunction
- Testosterone deficiency

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Page points

1. Low levels of oestrogen are common in women with diabetes because diabetes can affect endocrine function.
2. Vascular disease is still thought to be the most common organic cause of erectile dysfunction in men with diabetes.
3. In men with diabetes, studies have shown that autonomic neuropathy and endothelial dysfunction can cause nitric oxide to fail to induce smooth muscle relaxation, which then results in erectile dysfunction.

Pathophysiology and anatomy

Penile erection and female sexual function is predominantly a vascular event which occurs via the autonomic nervous system. FSD tends to be mainly dyspareunia and vulvodynia (persistent pain or burning and itching of the vulva). Women do also express difficulty with desire and arousal – although this is an area which still requires further research.

Either way, sexual stimulation results in parasympathetic activity which leads to the relaxation of the smooth muscle of the helicine arteries and, in men, the corpus cavernosum. The relaxation of the corpus cavernosum leads to compression of the outflow venules against the inflexible tunica albuginea, reducing venous outflow. The single phenomenon of smooth muscle relaxation thus produces both increased arterial inflow and reduced venous outflow from the erectile tissue, leading to an erection. Nitric oxide has now also been identified as the agent largely responsible for this smooth muscle relaxation (Price, 2010).

Low levels of oestrogen are common in women with diabetes. This is because diabetes can affect endocrine function, thereby impacting upon the amount of lubrication produced during arousal. Painful intercourse is usually described as either deep dyspareunia (pain on deep intercourse) or superficial dyspareunia (pain in the external genital area, also known as vulval pain).

Hyperglycaemia can lead to infections such as balanitis and thrush developing more easily. These can cause both physical and psychological effects, due to anatomical abnormality (scarring), pain, discomfort and risk of transmitting infection, and can also inhibit response to treatment.

Difficulties with orgasm can have a variety of psychological causes, but medical conditions, such as diabetes, which interferes with blood or nerve supply to the clitoris and penis, can also be to blame.

Treatment for women

There is little evidence in regard to treatment options for women with sexual dysfunction, and caution needs to be applied until further research is carried out. However, any improvements in blood glucose control will help with the prevention of diabetes-related long-term complications.

Aetiology of ED in men with diabetes

The prevalence of ED in men with diabetes varies between 35% and 90% (Malavige and Levy, 2009). It is three times more common in men with diabetes and tends to occur around 15 years earlier in this group of men than those without diabetes. (Feldman et al, 1994). It is well known that both vascular disease, neuropathy and hypertension can potentially be a complication of diabetes and these are all potential causes of ED, as well as medication side-effects and psychogenic factors.

In men with diabetes, studies have shown that autonomic neuropathy and endothelial dysfunction can cause nitric oxide to fail to induce smooth muscle relaxation, which then results in ED. However, vascular disease is still thought to be the most common organic cause of ED, and more recently this has led to evidence that ED should be seen as an early warning sign for more widespread vascular disease (Jackson et al, 2010).

ED precedes the onset of coronary artery disease in about 65% of men (Montorsi et al, 2003). Studies have also shown that it can be up to 5 years before the occurrence of a vascular event (Hodges et al, 2007). This increased awareness of ED as a red flag for cardiovascular health gives the healthcare professional an opportunity to improve primary prevention of vascular disease and cardiovascular events in this group of men.

The Massachusetts Male Aging Study found that only 10% of men will seek or receive treatment for their ED (Feldman et al, 1994). Although one should not "tout" for business it is important to be confident in having a routine discussion with your patients at least annually during a diabetes review. This is highlighted by a study investigating the relationship between ED and coronary vascular disease in 372 people from UK general practices. Almost half of men with ED missed opportunities for risk assessment and intervention because they did not acknowledge

or discuss the fact that they had a problem (Hodges et al, 2007).

More recently, hypogonadism and low testosterone have also been identified as playing a part in ED. In one study by Kapoor et al (2007), 20% of men with diabetes had a total testosterone level of <8 nmol/L. Unless otherwise contraindicated, if a man is found to have testosterone deficiency and reduced libido or ED, then testosterone replacement therapy (TRT) should be considered (Handelsman, 2008)

Initial assessment for all men with ED or diminished libido should include serum testosterone and prolactin measurement. General agreement is that a total testosterone above 12 nmol/l does not require replacement. Patients with a serum testosterone below 8 nmol/L often do benefit from TRT. There is now some evidence that a trial of therapy in those men with a testosterone level of 8–12 nmol/L may show benefit. Because there is a diurnal variation in testosterone release, blood samples should be taken between 7 am and 11 am without fasting, when testosterone should be at its highest level.

Smoking, alcohol and lifestyle should be assessed, and any improvements encouraged.

Effects on partners

The person experiencing sexual dysfunction can have poor self-image and may even avoid physical contact, leading to withdrawal from social relationships. For those in a relationship it can affect partners too – the anxiety and tension that this brings can cause low physical and emotional satisfaction, which in turn can lead to anger and depression. It is important to try and involve the partner in a patient consultation and encourage them to talk about this with each other.

In the PAIRS study conducted by Dean et al (2006), a psychological and interpersonal relationships scale was developed which was a measure to assess the broader psychosocial and interpersonal outcomes of ED treatments. The study also looked at the sexual self-confidence of a man and his ability to achieve an erection and enjoy fulfilling sexual experiences.

Treatment for men with ED

As a healthcare professional, you need to ask yourself:

- Am I prepared to ask about and discuss ED with my patients?
- Do I ask everyone with diabetes about sexual dysfunction?
- Who provides a sexual dysfunction service locally?

Then there are questions to ask the patient:

- What is the problem?
- Why is it a problem?
- What is your partner's attitude?
- What do you hope to achieve as a result of reporting the problem?

If you then feel confident to deal with the patient, there are then specific questions to be asked about:

- Speed of onset of sexual dysfunction.
- Presence of physiological erections.
- Bladder symptoms.
- Symptoms of autonomic or peripheral neuropathy.
- Symptoms of macrovascular disease.
- Endocrine questions.
- Drug history.
- Physical examination.

Once these have been addressed, treatment options can then be discussed and offered. Withdrawal of a drug could compromise the treatment of another condition and it is important to remember that the problem being treated, as well as the drugs prescribed to treat it, can be associated with ED.

Drug therapy

There are three phosphodiesterase type-5 (PDE-5) inhibitors on the market: sildenafil, tadalafil and vardenafil. All three appear to have similar efficacy and tolerability. Caution should be used in cardiovascular disease, and these drugs are contraindicated in patients receiving nitrates.

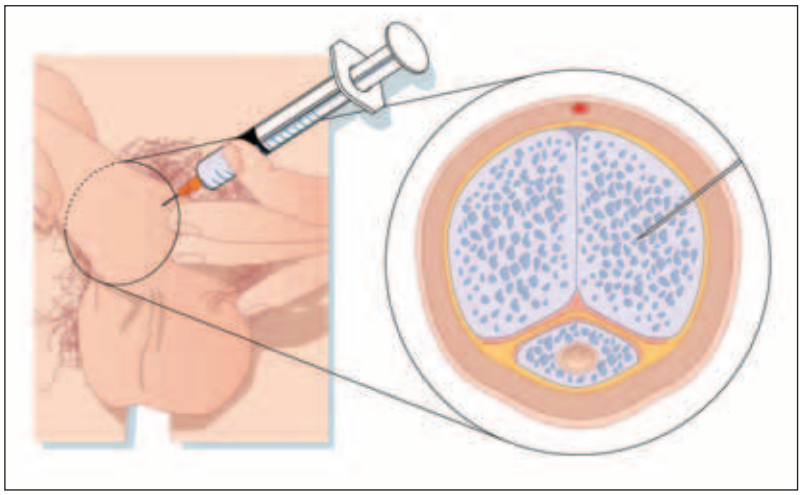
Vacuum therapy

Available on prescription, vacuum therapy is the most successful treatment option for those who choose not to try pharmacological treatments or in whom they are contraindicated. Even in the

Page points

1. If a man has testosterone deficiency and reduced libido or erectile dysfunction, then testosterone replacement therapy should be considered.
2. Be aware that erectile problems can affect partners too, so it is important to try and involve the partner in the consultation and encourage the couple to communicate.
3. Careful questioning and assessment is required before addressing treatment options.

Figure 1. The site for giving an intracavernosal therapy injection.



presence of extensive vascular disease or severe autonomic neuropathy, vacuum therapy in men with diabetes has shown good results.

Intracavernosal therapy

Alprostadil (prostaglandin E1) is given by intracavenosal injection. This is a popular treatment, although most studies show a high long-term discontinuation rate. *Figure 1* shows where the injection is given.

Testosterone replacement therapy (TRT)

There are various preparations for testosterone replacement – topical gels, patches and injections. Individuals need to be monitored 3- to 6-monthly for 12 months and then annually. TRT is contraindicated in anyone who has had prostate cancer or primary liver tumours.

Conclusion

The issue of sexual dysfunction has been long neglected by healthcare professionals, even more so with female sexual dysfunction. There are a number of reasons for this, including lack of knowledge, training and embarrassment. Sexual function should be discussed at a review as routine as retinopathy screening. There are a number of treatment options for healthcare professionals to offer patients; however, if these fail, then a referral to secondary care or a more specialist referral can often help to improve the outcome for these people. Those with complex comorbidities may require a more specialist review and a trial of different medications or therapy.

If a healthcare professional is not confident in how to treat these individuals, a simple referral to a specialist can be made. Signposting people in the right direction is often enough to break down their barriers and to empower them to improve their sexual function and diabetes management. ■

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