

Erectile dysfunction in diabetes: Providing a nurse-led referral service

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Article points

1. An audit showed that at least 50 % of men coming through routine diabetes clinics report erectile dysfunction.
2. The audit also identified that 80 % of men with erectile dysfunction would like to talk to someone about the condition.
3. A local nurse-led erectile dysfunction clinic has reduced waiting time for initial assessment of ED from 7 months to 1 month.

Key words

- Erectile dysfunction
- Nurse-led referral service

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Erectile dysfunction (ED) is defined as the inability to achieve an erection that is adequate for intercourse to the mutual satisfaction of both partners (Eardley et al, 1999). At least 50 % of men with diabetes will suffer from ED at some time in their life (Fraser, 2004). An audit was undertaken to ascertain the prevalence of ED in the male population with diabetes attending the Royal Infirmary of Edinburgh, to identify groups potentially most at risk of developing this condition and to qualify the need for a nurse-led ED referral service.

Erectile dysfunction (ED) has always been a taboo subject that is avoided both by healthcare professionals and their patients (Cummings, 2006). Unfortunately, it is the most common sexual problem experienced by men with diabetes and some would suggest the incidence may be as high as 60 % of men over the age of 60 years (Williams and Pickup, 2005). There are several physical factors which may contribute to ED in men with diabetes, including autonomic neuropathy, vascular disease associated with diabetes and endothelial dysfunction (Eardley, 2003). ED can also have a huge impact on personal relationships and, in the author's opinion, it is important to encourage the individual's partner to attend the sessions too.

Initial audit

A total of 180 men attending the routine diabetes review clinic at the Royal Infirmary of Edinburgh between August 2005 and

January 2006, completed an anonymous 14-point questionnaire, see *Box 1*. HbA_{1c} results were collected by matching the date of birth given as part of the questionnaire to individuals on the clinic's registry and using any recorded HbA_{1c} result.

Audit results

In total, 180 men completed the questionnaire (110 with type 2 diabetes, 70 with type 1 diabetes) and 51.1 % (n=92) felt they had a problem either obtaining or maintaining an erection suitable for sexual intercourse. This group had a mean age of 57.6 (SD: 8.3) years and were significantly more likely to have type 2 diabetes than type 1 diabetes ($P=0.001$). A positive correlation between the duration of diabetes and frequency of ED was observed ($r=0.354$, $P=0.002$), however, surprisingly, no association was noted between ED and poor glycaemic control (HbA_{1c} in men with ED: 8.14 %; HbA_{1c} in men without ED: 7.75 %). Most importantly, in the author's opinion,

Box 1. Copy of questionnaire completed in confidence by men attending the routine diabetes review clinic at the Royal Infirmary of Edinburgh between August 2005 and January 2006.

Please tick the appropriate boxes

What type of diabetes do you have? Type 1 Type 2

How long have you had diabetes? years

What is your date of birth?/...../.....

Do you have problems obtaining an erection? Yes No

Do you have problems maintaining an erection? Yes No

How long have you experienced problems with your erections? <1 year 1–2 years
3–4 years >5 years

Are you currently taking medication for this? Yes No

Would you mention this problem to your doctor or nurse? Yes No

Would you prefer the doctor/nurse to mention the subject first? Yes No

Would you find the subject too embarrassing to talk about? Yes No

Would you be comfortable discussing your problem with a female nurse? Yes No

Does your problem affect your relationship? Yes No

Does your problem affect your overall quality of life, such as low self esteem or depression? Yes No

Would you accept help if it were available? Yes No

Please put your completed questionnaire in the envelope provided.
Many thanks for your help with this questionnaire!

was that almost 80% of men with ED were not receiving treatment for the condition but were keen to seek help if it were offered. See *Box 2* for full details of the audit findings for the respondents who reported ED.

Service redesign

The data collected from the questionnaire audit highlighted the need to provide a service to men with diabetes and ED. It was also apparent that a referral service was required due to the lack of available referral facilities. Current referral options were either to the local sexual dysfunction clinic at the Royal Infirmary of Edinburgh, which has a waiting time of around 7 months, or to the Urology Department at the Western General Hospital, Edinburgh. In the past, doctors had a tendency to write to GPs and ask them to prescribe a PDE 5 inhibitor. In this scenario, the individual was generally given a tablet

Box 2. Data collected from men completing audit questionnaire who reported symptoms of ED.

Diabetes type	Type 1: 66 (72%) Type 2: 26 (28%)
Mean diabetes duration	12 years
Mean age	57.6 years
Duration of ED	<1 year: 9 (9.8%) 1–2 years: 17 (18.5%) 3–4 years: 38 (41.3%) >5 years: 28 (30.4%)
Taking current medication to treat ED	19 (20.2%)
Would prefer healthcare professional to raise the subject of ED than doing so themselves	60 (65.7%)
Would find the subject too embarrassing to talk about	21 (22.8%)
Reporting that ED affects their relationship	61 (66.3%)
ED having negative impact on QOL	54 (58.7%)

with no education, drug titration or follow up. Understandably, they then reported that the tablets were ineffective. Consequently, the multidisciplinary team at the Royal Infirmary of Edinburgh were more than happy to support the establishment of a nurse-led ED clinic.

The data also provided evidence for a business plan to apply for funding for the first year. Initially, funds came from a pharmaceutical company and enabled the establishment of the clinic.

Training

Prior to starting the clinic, the author identified that she needed to undertake a degree of training. While she spoke about ED during education sessions as one of the possible long-term complications of diabetes, she needed to learn what caused ED and how to help individuals with the condition with appropriate and safe treatments.

Pharmaceutical representatives were approached to provide information about specific therapies for ED as well as patient

Box 3. Protocol for a nurse-led ED referral service.

- Men will be referred to the ED nurse by other healthcare professionals. Individuals should have a physical examination and endocrine profile performed by physician prior to referral.
- An appointment letter will be sent to the individual, inviting a partner to attend if appropriate.
- Patients will be assessed using a standard clinical checklist and a history of their ED problem will be taken (see *Box 4*).
- Improve diabetes control if HbA_{1c} >7.5% by offering lifestyle intervention advice, further education and dose adjustment.
- Check endocrine profile (if not already undertaken prior to visit). Act on results as appropriate (see *Box 5*).
- If evaluation suggests a drug induced cause for ED, discuss with clinician regarding appropriate change of medication.
- If evaluation suggests there may be a predominantly psychological component to the problem, refer to psychosexual counsellor.
- If evaluation suggests there is a predominantly organic cause or the individual declines psychosexual counselling, the nurse will discuss treatments such as: PDE-5 inhibitors; intracavernosal alprostadil; intra-urethral alprostadil; vacuum devices; penile prosthesis; and psychosexual therapy.
- Patients will have the opportunity to select preferred treatment regimens providing no contraindications exist.
- If oral medication is chosen, action, duration and possible side effects should be discussed.
- If intracavernosal alprostadil is chosen, the nurse will:
 - teach the patient the principles of self injection
 - inject or watch the patient inject a test dose of intracavernosal alprostadil
 - discuss potential side effects (such as priapism, scarring, pain, fibrosis)
 - discuss and give written information on dose adjustment – increments of 2.5, 5, 10, 15 and 20 µg required to achieve tumescence of up to 1 hour.
 - discuss frequency of use
 - ensure the individual understands the procedure if priapism (erection lasting >4 hours) occurs
 - show demonstration DVD.
- If intra-urethral alprostadil chosen, the nurse will:
 - teach the individual the principles of intra-urethral administration
 - administer or watch the patient self administer a test dose of alprostadil
 - discuss potential side effects (such as priapism and pain)
 - discuss and give written information on dose adjustment (increments of 125, 250, 500 and 1000 µg required to achieve tumescence of up to 1 hour
 - discuss frequency of use)
 - ensure the individual understands procedure if priapism occurs
 - provide a demonstration DVD.
- If vacuum device or constriction rings are chosen, the nurse will:
 - teach the patient the principles of using a vacuum device
 - show demonstration video
 - ensure there are no contraindications present, such as warfarin prescription
 - reiterate constriction band to be in place for 30 minutes maximum
 - provide patient with details on obtaining device.
- If penile implant is preferred by individual (a last resort), refer appropriately.
- In cases where ED nurse is uncertain about management, the individual will be referred to clinician.
- The nurse will undertake correspondence to the primary care doctor in all cases of men attending the ED clinic.
- Test dose prescriptions will be authorised by a clinician. All subsequent prescriptions (if applicable) will be issued by the primary care doctor in line with Schedule 2, which details that people with diabetes are entitled to free ED treatment (HM Government, 1990; Secretary of State for Health, 1999).
- Follow-up appointments will be authorised by the ED nurse as appropriate until the individual has achieved a satisfactory response (an erection suitable for sexual intercourse lasting between 30–60 minutes).
- Clinic attendees are given contact details to use to report any problems with their chosen therapy. This will enable them to avoid having to go through a second referral process and allows them to be seen within 2 weeks to discuss alternative therapies.

information leaflets and demonstration aids for use in the clinic. Furthermore, they invited the author to symposiums and education sessions addressing ED in diabetes. This helped the author to understand how each therapy worked, what doses were appropriate, contraindications and possible side effects to ensure safe and effective treatment. An 'educated educator' also ensured that clinic attendees were educated appropriately with regards to their chosen therapy.

The author attended the Royal College of Nursing-accredited course NEED (Nurse Education in Erectile Dysfunction), which proved invaluable both in terms of education provision and as an opportunity to network with other healthcare professionals with similar interests.

The author observed ED clinics to gather ideas for good practice with regards to conducting an ED consultation and administering test doses of intracavernosal injections. This partnership with other healthcare professionals also provided contacts to call on should further help or advice be required.

The referral process

When discussing the long-term complications of diabetes with men during education sessions, educators made the attendees aware that ED is a very common problem associated with diabetes. In the author's opinion it has proven important to put the individual at ease by using language they understand and ensuring they fully comprehend what is being asked during assessment to ensure the correct information is recorded. This intended to help men with diabetes and ED understand that they are not alone in experiencing the condition and can be a good gateway to discussing the subject.

These education sessions were undertaken when individuals attended for insulin conversion or to improve glycaemic control on a one-to-one basis and were for both new and returning men. Staff were happier to discuss ED with individuals during these sessions as they were aware of the referral service and

they would not have to deal with the problem alone.

Protocol

Following the audit to qualify the problem and the education to fully understand its management, the author then designed a protocol for a nurse-led ED referral clinic. This was reviewed and approved by a consultant physician. The full protocol is shown in *Box 3* and the rationale for its various components are detailed below. For each clinic visit, a one-hour time slot is allocated.

Blood test

Blood tests to assess testosterone levels are essential regardless of whether or not the individual feels his libido is intact. This is because it is important to check the hormone profile of each man regardless of age. Younger men with an exceptionally low testosterone levels (for example, those aged 30–40 years with free testosterone levels calculated to be below the normal parameters of 10–30 nmol/l) are referred to the endocrinology department for possible testosterone replacement therapy. Those with an abnormally high prolactin level, which is not drug related, are also referred to an endocrinologist for further investigations.

Blood pressure

By checking blood pressure, it may be possible to identify the need for changes to antihypertensive drugs, which are known to contribute to erectile problems (for example beta blockers). Uncontrolled blood pressure is addressed: the Scottish Intercollegiate Guideline Network (SIGN) suggest blood pressure targets for all people with diabetes to be below 140/80 mmHg (SIGN, 2001). If an man with ED has suboptimal blood pressure, it would be recorded and would be detailed in a letter to his GP when informing the GP of the consultation.

HbA_{1c}

HbA_{1c} is checked and suboptimal glycaemic

control (preferably around 7% but certainly below 7.5% [SIGN, 2001]) is addressed by advising on how it can be improved via pharmacological or lifestyle modifications.

Box 4. ED clinic initial assessment checklist.

Telephone number for follow-up:.....
 Occupation:
 Marital status:.....
 Presenting problem/history:.....
 Nature and development/libido:.....
 Morning/spontaneous erections:
 Relationship with partner:
 Medical issues:.....
 Medication:
 Smoking status:
 Alcohol intake:
 Exercise degree and frequency:.....
 Weight:.....
 HbA_{1c}:
 BP:.....
 Endocrine bloods:
 Goals/motivation/expectations:
 Suitability for psychotherapy:
 Preferred treatment:
 Signed.....
 Date.....

Box 5. Endocrine and treatment assessment in ED.

Screening

Two gonadotrophins, luteinising hormone (LH) and follicle-stimulating hormone (FSH), and testosterone levels should be investigated to screen for evidence of hypogonadism. Normal levels are as follows. LH: 1.5–9.0 U/l; FSH: 1.5–9.0 U/l; testosterone: 10–30 nmol/l. Any deviation outside the normal ranges of LH and FSH (both higher and lower) in addition to low testosterone levels would indicate a diagnosis of hypogonadism.

Any relevant elevation in prolactin levels, which is not associated with medication, would be investigated further by endocrinology to exclude a prolactinoma.

Testosterone and calculated free testosterone levels should be investigated, especially if individual complains of a reduced libido. It is important to confirm these findings with a second early morning blood sample. Bear in mind that as men age testosterone levels naturally decreases (Mayo Clinic Staff, 2006).

Treatment

If the individual is younger, for example in their 30s, with an elevated LH and FSH and low testosterone level, hormone replacement therapy may be beneficial. Testosterone replacement therapy can be used with or without a PDE-5 inhibitor.

In a 45-year-old man whose blood works come back as follows: LH: 9.9 U/l; FSH: 14.4 U/l; testosterone: 7.4 nmol/l from a 09.00 h blood sample and normal prolactin levels, a diagnosis of slight testicular failure should be considered. Therefore, he may benefit from testosterone replacement therapy in conjunction with a PDE-5 inhibitor.

Box 6. Pharmacological ED therapy.

Phosphodiesterase type-5 (PDE-5) inhibitors

Sildenafil citrate, tadalafil and vardenafil are all PDE-5 inhibitors. These are available in tablet form and, in the author's experience, are usually considered an acceptable form of therapy by the individual. It is a non invasive therapy, which if tolerated and titrated appropriately can prove to be very effective. In the author's experience, men with diabetes require the higher dosage to achieve a satisfactory erection.

These tablets will not be effective if there is no sexual stimulation after taking the required dose. Sexual arousal activates chemical messengers, enabling vasodilation and increased blood flow into the penis [Trigwell 2005], to obtain an erection. These tablets should be taken 8 times at the highest dose before accepting failure with oral therapy. If a patient fails on one PDE-5 inhibitor, it is worthwhile trying a different one.

Precautions

There are several side effects associated to these drugs: headache, dyspepsia, facial flushing and nasal congestion are the most common. These drugs are contraindicated when patients are receiving nitrate therapy and some alpha-blockers. A common contraindication for any PDE-5 inhibitor is any form of nitrate therapy, for example, glyceryl trinitrate (GTN) spray used for treating angina.

Intra cavernosal injections

Intra cavernosal injections, for example alprostadil (Caverject, Pfizer), is a more invasive therapy. It consists of an injection into the corpus cavernosum (two sponge-like regions running down either side of the penis, see *Figures 1 and 2*). Alprostadil relaxes the smooth muscle in the corpus cavernosum to allow the blood to engorge the penis to obtain an erection (Eardley et al, 1999). Individuals using this treatment should be taught to rotate their injection sites.

Precautions

Caution should be taken when used in men taking antiplatelet therapy due to the possibility of excessive bleeding at the injection site and bruising. It is not advisable to use this alprostadil injections if taking Warfarin. Follow up sessions should be aware of detecting signs of penile fibrosis.

Intra-urethral applications

Intra-urethral alprostadil (Muse, Meda Pharmaceuticals) is administered via a sterile applicator that inserts a soluble pellet into the urethra which is absorbed via the urethra into the corpus cavernosum. *Figure 3* shows an example applicator. As with the injection method of application, alprostadil acts by relaxing smooth muscle to obtain an erection.

Precautions

This therapy may cause the partner to experience some vaginal irritation.

Reference material: Viagra SPC, Levitra SPC, Cialis SPC, Caverject SPC, Muse SPC.

Target HbA_{1c} should be maintained to prevent the onset and progression of long-term complications.

Weight

Weight is checked and with exercise being the main recommendation to help with weight loss if overweight. The additional benefits of exercise on improvement of ED are outlined: Eardley (2003) suggests that exercise is beneficial for sexual function and

the cardiovascular benefits of exercise have been frequently observed. A consultation with a dietitian is offered for those who need additional assistance in diet management.

Medical examination

A past medical history is taken paying particular attention to cardiac problems and current medications are noted. The effects of smoking and excessive alcohol on ED are discussed and are discouraged.

Prior to referral the clinic requires that a physical examination is undertaken by a doctor to rule out alternative sources of the dysfunction, for example, Peyronie's disease. If an examination has not been carried out or, for example, if the patient complains about an abnormality, the diabetes registrar will assist the nurse with a physical examination during the appointment.

Treatment

After assessment, psychosexual counselling is offered if deemed appropriate and a referral to a counsellor can be made. There is a long waiting list for psychosexual counselling, around 7 months at Royal Infirmary of Edinburgh, but one which is possibly less at other sexual health clinics in the area. This service is free and consists of several visits by the couple to the counsellor. The man with ED may also see a counsellor on a private basis. Private funding of counselling can result in an appointment being made with a much shorter waiting time.

Current available pharmacological therapies are discussed in detail, including the action and duration of each agent, administration methods, titration guidelines and possible side effects. At present, pharmacotherapies offered in the author's clinic include sildenafil citrate (Viagra, Pfizer), tadalafil (Cialis, Eli Lilly & Company), vardenafil (Levitra, Bayer Healthcare) and alprostadil (Caverject, Pfizer; Muse, Meda Pharmaceuticals). See *Box 6* for more information. Dose titration is recommended for all of the above therapies to achieve a satisfactory erection which should last approximately half an hour to one hour.

All of the above therapies may cause a priapism: a prolonged erection of >4 hours in duration. If this occurs, exercise or a cold shower can often diminish the symptoms. If the erection persists, advise the individual to go to their local A&E: the procedure used to reduce the erection will be insertion of a butterfly needle into each side of the penis to draw approx 20 ml of blood.

Vacuum devices and constriction bands can be used in men who are unable to maintain their erection either with or without the use of a PDE-5 inhibitor (see *Figures 4 and 5*). The constriction band may stay in situ for a maximum of 30 minutes. As per the instruction leaflet, caution should be taken when any individual is taking antiplatelet therapy and these devices should not be used in conjunction with warfarin.

Vacuum erection devices enables the individual to obtain an erection which is then maintained with a constriction band. Erections can feel cold to partner and may pivot at the base of the penis. Caution is once again advised with antiplatelet therapy.

Each individual is given a choice of treatment options and invited back for follow up after 2 months. Contact details are given if further help or advice are required in the interim.

Outcomes

Locally, the existing facilities for treating ED had extremely long waiting lists of around 7 months. The new nurse-led ED clinic run by the author runs for 4 hours per week and men referred with ED are now able to be given an appointment for initial assessment within a month.

Referrals were initially taken from members of the multidisciplinary team within the secondary care setting. However, this service has now been extended so that primary care practitioners can refer men with diabetes for education, assessment and treatment of ED. Individuals can also self refer. The author has noted that the multidisciplinary team are happier to approach the subject of ED with their patients in the knowledge that the

individual can be referred on for assessment and appropriate treatment.

To date, 14 months after the nurse-led ED clinic opened, 79 men with diabetes and ED have reported successful outcomes at their follow-up appointment. ■

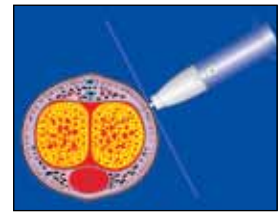


Figure 1. Diagram showing cross section of an intra cavernosal injection of alprostadil.



Figure 2. Illustration showing an intra cavernosal injection.



Figure 3. Intra-urethral alprostadil applicator.



Figure 4. Constriction bands for use by men who are able to achieve but not sustain an erection.



Figure 5. Vacuum device, constriction bands and explanatory video.

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