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ARTICLE

Erectile dysfunction: causes, assessment and management options

SUMMARY

Erectile dysfunction is one of the most common male sexual dysfunctions. The diagnosis can usually be made by a detailed history and examination.

Men with erectile dysfunction benefit from multimodal management strategies. These include lifestyle modification, medical treatment and psychosexual counselling and therapy.

An oral phosphodiesterase-5 inhibitor is often prescribed for erectile dysfunction. Providing simple and clear instructions is critical to realise the full benefits of these drugs.

Those with severe vascular disease or a history of pelvic surgery may not respond to phosphodiesterase-5 inhibitors. Anxiety or unrealistic expectations can also result in a poor response.

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Introduction

Erectile dysfunction is a prevalent sexual dysfunction in men.[1] Male sexual dysfunction can occur at any age, but erectile dysfunction and diminished libido increase with age. There may be underlying causes.

Multimodal management is needed, but when drugs are indicated, oral phosphodiesterase-5 inhibitors or self-injectables such as alprostadil are options for erectile dysfunction.

It is important to initially discuss treatment objectives and outcomes, and set realistic expectations to avoid dissatisfaction. While there is information available about drugs to use in erectile dysfunction, the information is rarely accompanied with specific advice for the patient on timing and other details about how to use the drugs.

Erectile dysfunction

Men with erectile dysfunction are unable to achieve an erection firm enough for sexual intercourse.

Causes

There are many causes and risk factors for erectile dysfunction (Box 1).[2] These were traditionally classified as organic, psychogenic or mixed. However, with advancements in the fields of psychological science and sexual medicine, the current view is that the aetiological factors are multimodal[3] – biological, psychological, sociocultural, relational and sexual.

Assessment

Men presenting with erectile dysfunction are initially assessed with a comprehensive history (Box 1). This helps the clinician to understand and differentiate the causes as predisposing (why this person?), precipitating (why now?) and perpetuating (what is keeping the problem?) factors. The history includes lifestyle (quality and quantity of sleep, snoring and sleep apnoea, weight, exercise, alcohol, smoking history), general health (physical and mental, medicines) and a relationship and psychosexual history.[4,5] Box 2 shows some key questions to ask. Eliciting details about the quality of morning erections and erectile capacity during other sexual activities (e.g. masturbation) are critical to understand the underlying aetiology.[4] The history of past and current treatment for erectile dysfunction, and the response achieved, helps in tailoring further management.

A distinction must be made whether the man has erectile dysfunction or premature ejaculation because some men are not good at describing their problem. The man with premature ejaculation may say he has erectile dysfunction because he loses his erection early after ejaculation. Conversely, the man with erectile dysfunction may complain of premature ejaculation as he rushes to ejaculate quickly before he loses his erection. Erectile dysfunction and premature ejaculation are often confused but can occur together.

The history should include a review of medicines (as listed in Box 1). This could provide valuable insight about the sexual adverse effects of certain drugs and, more importantly, a timeline between starting a specific drug and the onset of erectile complaints.

The physical examination should include, at a minimum, general parameters (weight, waist circumference, body mass index and blood pressure) and the genitals. If investigations are indicated, the

Box 1 Risk factors for erectile dysfunction

- Advanced age
- Atherosclerosis-related risk factors (e.g. cardiovascular disease, cigarette smoking, hypertension, dyslipidaemia, diabetes mellitus)
- Pelvic surgery (e.g. radical prostatectomy), radiation, trauma
- Endocrinological conditions (e.g. hypogonadism, hyperprolactinaemia, thyroid disorder)
- Obesity and metabolic syndrome
- Substance abuse – alcohol, illicit drugs (e.g. cannabis, barbiturates, cocaine, heroin, methamphetamine)
- Psychological (partner-related, stress, guilt, situational anxiety, self-image problems, low self-esteem, history of sexual abuse, highly restricted sexual upbringing, generalised anxiety disorder, depression, psychosis)
- Erectile dysfunction associated with other sexual dysfunction(s) (e.g. premature ejaculation, sexual aversion disorder, anorgasmia)
- Medicines:
  - antihypertensives (e.g. diuretics, alpha and beta blockers)
  - psychotropics (e.g. selective serotonin reuptake inhibitors and other antidepressants, antipsychotics, anxiolytics)
  - anticonvulsants, anti-Parkinson's drugs
  - hormone-affecting drugs – antiandrogens, corticosteroids, chronic opioid use
- Neurological conditions (Alzheimer's disease, multiple sclerosis, Parkinson's disease, stroke), spinal cord and peripheral nerve disorders (diabetic neuropathy)
- Penile abnormalities (e.g. Peyronie's disease, venous leak)

Box 2 Key questions in the assessment of erectile dysfunction

- Is the problem intermittent, global or situational?
- Is the problem recent or long term?
- Is there an unusual curvature of the erection or an episode of sexual trauma to the erect penis?
- Has the patient ever suffered from mental health problems?

minimum is serum lipids, fasting glucose or ideally glycated haemoglobin.[4,5] Should hypogonadism be suspected, measure serum testosterone on a blood sample taken before 11 am.[4]

A validated questionnaire, for example the International Index of Sexual Function (IIEF-5),[6] can be an adjunct to history and examination. However, such questionnaires should not be used alone for diagnosing erectile dysfunction.[5]

Management options

The initial treatment of erectile dysfunction addresses lifestyle changes and psychological or relationship problems. Sex therapy is indicated particularly when there is a significant psychological contribution to erectile dysfunction and when there is no response to medical management.[7] Ideally, sex therapists should be healthcare professionals with specific qualifications in the field of human sexuality along with skills in counselling and psychosexual therapy. General practitioners, psychologists and sexual health physicians can offer certain aspects of sex therapy, whereas a well-qualified and trained sex therapist can offer comprehensive psychosexual education, counselling and therapy.

Phosphodiesterase-5 inhibitors

The first step of drug treatment is an oral phosphodiesterase-5 inhibitor:

- sildenafil 25, 50 and 100 mg
- vardenafil 5 and 20 mg
- avanafil 50, 100 and 200 mg
- tadalafil 5, 10 and 20 mg.

Phosphodiesterase-5 inhibitors work best if taken 1–2 hours before sexual intercourse. Tadalafil has a two-hour lead-in time, when taken as required, so is often used as a daily low-dose (5 mg) treatment. Daily dosing may also benefit men with erectile dysfunction who have benign prostatic hyperplasia as it can improve lower urinary tract symptoms.

Large meals and alcohol should be avoided before a dose, but when phosphodiesterase-5 inhibitors are taken daily, food and alcohol have less impact on the response. It is critical to educate patients that phosphodiesterase-5 inhibitors do not create sexual stimuli. They only help with getting and maintaining an erection when there is adequate external sexual stimulation.

Depending on the severity of erectile dysfunction, the clinician decides on the appropriate starting dose. Importantly, patients should be made aware that they need to take the drug as prescribed and, on five to six occasions, to assess the treatment effect. Failure to provide this information could lead to a suboptimal or no response, which in turn could lead to an inappropriate use of higher doses or the addition of other treatment options. The response to phosphodiesterase-5 inhibitors can be affected by anxiety, alcohol, excessive expectations of how these drugs should work, and not waiting long enough for them to work. The American Urological Association Guideline states that sildenafil, tadalafil, vardenafil and avanafil have similar efficacy in men with erectile dysfunction and that dose-response effects across phosphodiesterase-5 inhibitors are small and non-linear.[8] While there is no firm evidence that switching from one phosphodiesterase-5 inhibitor to another will have a beneficial effect, it is worth a clinical attempt provided the expectations are discussed with the patient.

The classic adverse effects of phosphodiesterase-5 inhibitors are flushed face, headaches, blocked nose, altered colour vision (mainly with sildenafil) and

gastric reflux. Most of these adverse effects have a dose-response pattern. The average rates are similar across the phosphodiesterase-5 inhibitors except for dyspepsia (lowest rates reported with avanafil), flushing (lowest rates reported with tadalafil), and myalgia (lowest rates reported with vardenafil and avanafil).[8] Tadalafil is associated with low back and leg pain which often go away when the drug is stopped.

Phosphodiesterase-5 inhibitors should not be prescribed if the patient is taking nitrates or uses 'recreational' amyl nitrite. There is a risk of a precipitous blood pressure drop.

Injectable drugs

Penile injections tend to be used when oral phosphodiesterase-5 inhibitors are not effective. The drugs used for intracavernosal penile injection are vasoactive. They include alprostadil, which may be combined with papaverine and phentolamine. Penile injections work rapidly so sexual activity may begin within 10–15 minutes of injecting.

Care must be taken to use the lowest effective dose to avoid priapism which can be a medical emergency. The patient may also experience delayed post-injection pain. Patient education (by means of explaining or referring to product information, or video demonstrations) is very important. The drug needs to be injected into the shaft at 10 o'clock or 2 o'clock positions, altered between different attempts, avoiding obvious veins and fibrosis.

Devices

High rates of patient satisfaction have been reported for vacuum erection devices. They can be an effective and low-cost treatment option for any men with erectile dysfunction but more so for those with diabetes, spinal cord injury or after prostatectomy.[8] Older men may tend to use vacuum mechanical devices as they are drug free. However, vacuum erection devices can be cumbersome and require some training in correct use.

Shockwave therapy applies acoustic shock waves to the penis. This aims to improve vascularisation. Shockwave therapy appears to work best for the older patient with vasculogenic erectile dysfunction, but lacks robust evidence of efficacy.[9]

A penile implant is a restorative treatment option. It is a very effective treatment no matter the aetiology or severity of the erectile dysfunction and even if all other treatments have failed or are not suitable. However, it is irreversible.

Evaluation of treatment outcomes

Evaluating treatment outcomes for erectile dysfunction depends on the management goals that were established before treatment. Erectile capacity across different sexual activities (intercourse, masturbation), quality of morning erections, reduction in distress and overall sexual satisfaction are some of the measures used to assess progress.

Conclusion

Erectile dysfunction is a common male sexual dysfunction. It requires a comprehensive clinical assessment and multimodal management. This may involve GPs, specialists and allied health professionals trained in the field of sexology.

Conflicts of interest: none declared

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