

Focus

Erectile dysfunction: an overview

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Erectile dysfunction is the inability to initiate and maintain an erection sufficient for sexual intercourse. All men experience failure in obtaining an erection at some time in their lives, but persistent erectile dysfunction is uncommon under the age of 40. The incidence increases rapidly so that 65 per cent of 70-year-old men have potency problems. This increase is mainly due to vascular disturbances and occurs approximately 10 years earlier in diabetic men. Ageing itself does not cause erectile dysfunction, although physiological changes do occur. Most men require more penile stimulation as they age. Erections are less rigid and any distraction leads to loss of erection which is often difficult to regain. The frequency of sexual intercourse is reduced with age, although satisfaction from sexual activity remains and is important for the man's sense of wellbeing. Smoking, hypertension and other cardiovascular problems, diabetes and alcohol abuse all add to the potential for erectile dysfunction.

Physiology of an erection

Flaccidity is the end result of sympathetic innervation of the smooth muscle of the cavernous tissue and penile arteries. Central psychogenic stimuli and simultaneous penile stimulation increase parasympathetic activity resulting in the relaxation of the penile smooth muscle. This phenomenon is mediated by activation of the NO/cGMP cascade with the resulting increase in blood flow through the penile arteries.

The increase in penile blood flow leads to tumescence and a rise in the intra-cavernous pressure, blocking the venous outflow, due to a rise in the resistance offered by the rigid tunical albuginea and, finally, rigidity. The above process is also known as the veno occlusive mechanism.

Aetiology of erectile dysfunction

Two categories are commonly recognised:

- clinical manifestations suggesting an organic cause
- clinical manifestations suggesting a psychological cause.

Key points

- Men with erectile dysfunction should be encouraged to overcome their reluctance to seek medical advice
- Smoking, hypertension and other cardiovascular problems, diabetes and alcohol abuse all add to the potential for erectile dysfunction
- For most men a good clinical history and physical examination is needed and sophisticated investigation is unnecessary
- The nature of the erectile problem needs to be distinguished from other forms of sexual difficulty such as penile curvature or premature ejaculation
- There are

Organic causes

These are diagnostic guides which suggest that the cause of the patient's dysfunction is probably organic in origin:

- gradual onset
- acute onset with an obvious cause (eg, spinal surgery, major pelvic surgery)
- constant dysfunction
- age over 65 years
- orgasm and ejaculation usually maintained
- erectile dysfunction risk factors present.

various treatment options available. It is best to start with non-invasive therapy and limit the more invasive forms to those with specific indication

Psychological causes

Consider psychological causes with the following:

- sudden onset without injury
- situational
- relationship problems
- young man
- orgasm and ejaculation may be altered
- no relevant risk factors.

DIAGNOSIS

For most men sophisticated investigation is unnecessary. A good clinical history is the basis of assessment, but as many patients are reluctant to discuss sexual activity a soft approach is required. I usually start by making my patients realise they are not alone by quoting statistics. I also praise them for having the courage to come forward and assure them I will try my utmost to make an appropriate diagnosis. And I assure men that I will start a treatment regimen with which they will feel comfortable.

I offer a 24-hour, seven-day service where men can phone me and discuss concerns or queries. I encourage patients to get their partners to phone me if they have any concerns regarding the condition, diagnosis, treatment and prognosis. I also make use of diagrams, educational material and videos where appropriate.

It is important to establish the nature of the erectile problem and to distinguish it from other forms of sexual difficulty such as penile curvature or premature ejaculation. It is useful in general practice to ask specifically about erectile dysfunction in those men in whom a high incidence is anticipated such as diabetes, patients with hypertension or multiple sclerosis.

The relative importance of psychological and organic factors may be determined from the

The relative importance of psychological and organic factors may be determined from the history. In organic erectile dysfunction there is usually a gradual and progressive loss of erection, typically with maintenance of libido and ejaculatory competence. Some physicians find it helpful to use a sexual questionnaire. I use one with a scoresheet, and it helps to eliminate some causes. It is important to give attention to the general and psychological health of the patient and to whether his partner still wants to be sexually active. Physical examination of the patient is important and

history

specific attention should be given to organic factors and to recognise any abnormality of the genitalia and prostate. Endocrine and vascular abnormalities such as hypertension and diabetes may be apparent, and the patient's appearance and conduct may suggest he is depressed. It is always important to rule out unsuspected diabetes mellitus, and to detect androgen deficiencies. It is also useful to rule out hyperlipidaemia and to do a PSA test and a digital rectal examination.

The following patients require specific investigation and referral:

- young men with hypogonadism
- the presence of hyperprolactinaemia
- men with focal neurological signs
- patients with psychiatric disturbances.

It is very important to obtain a list of drugs the patient is taking to manage long term medical problems. Many drugs per se can cause some form of erectile dysfunction or have an effect on erectile physiology: (a) major tranquillisers (b) antidepressants (c) antihypertensives: central sym-pathomimetics, ganglion blockers, beta blockers, vasodilators, diuretics, some ACE inhibitors, some lipid lowering drugs.

TREATMENT

General management

The initial management should be to advise patients to reduce their alcohol intake and smoking. Diabetic control should be monitored and it may be possible to adjust the existing drug regimen, although changing one antihypertensive drug to another seldom improves erectile function. Almost all men with erectile dysfunction will be affected psychologically, even if the cause is organic. In severe cases sexual counselling is important and it is preferable to also involve the patient's partner. Counselling helps to reassure the couple and ease tension in the relationship. Temporary erectile dysfunction is not uncommon and does not usually require pharmacological intervention.

Drug therapy

Most men consider this the treatment of choice. Yohimbine has a weak alpha adrenoreceptor blocking ability, and has not been very effective in many patients.

Oral phentolamine is being used in other parts of the world, and according to clinical trials is an effective oral treatment. Apomorphine (a dopamine receptor agonist) is currently being considered by Medsafe for registration as an oral treatment for erectile dysfunction in New Zealand. It obtained FDA registration and is a treatment being used by doctors in the US.

Sildenafil is the first effective oral drug that has been approved for the treatment of erectile dysfunction in New Zealand.

Further preparations with similar mechanism of action are likely to become available now the basic biochemical mechanisms of erection physiology are better understood.

a. Sildenafil (Viagra)

Sildenafil is a type 5 phosphodiesterase inhibitor that prevents the intracellular breakdown of cyclic GMP. It was originally developed for the treatment of angina pectoris and was found to increase the number of erections in patients undergoing clinical trials. It has now been licenced for use in the treatment of erectile dysfunction for men with organic and psychological aetiologies.

Sildenafil is rapidly absorbed after oral administration. It is taken 60 minutes before anticipated sexual activity and its effects last approximately four hours. I have found that in many patients the window of opportunity can be as long as eight hours.

The drug is available in three strengths, ie, 25, 50 and 100mg. Most patients seem to do well on 50mg.

Taking the drug itself does not provoke an erection as such, but enhances the continued relaxation of the cavernous smooth muscle initiated by the release of endogenous nitric oxide with an improved quality of erection.

Sildenafil is contraindicated in men taking nitrates due to the risk of hypotension. Clinical trials have shown it is efficacious in 40–80 per cent of men, depending on the aetiology of their dysfunction.

It has a relatively low side effect profile and the side effects consist mainly of headache (16 per cent), facial flushing (10 per cent) and dyspepsia (7 per cent). A mild transient disturbance of colour vision and also increased sensitivity to light or blurred vision has been found in 3 per cent of men. The side effects are all dose related.

It is important not to take sildenafil with any fat-containing foods, and simultaneous intake of alcohol can also affect the absorption. It is also advisable not to split tablets, because the chemical deterioration of the unused half can make it less effective.

b. Transurethral administration of alprostadil

Alprostadil was first licensed for use in the treatment of erectile dysfunction by intracavernous injection. This drug has been incorporated into a pellet that can be given by intraurethral application.

Alprostadil, the synthetic reproduction of the naturally occurring prostaglandin E1 acts by initiating an erection. In contrast to sildenafil, it initiates the relaxation of cavernous smooth muscle to bring about an erection.

This is a device-based treatment. Patients need to be instructed in the use of MUSE, which is introduced into the urethra with a disposable applicator.

The patient needs to pass urine beforehand to act as a natural lubricant and to facilitate the absorption of the drug. Absorption is also facilitated by the patient rolling his penis between the palms of his hands. Some patients find that a constrictive ring around the base of the penis enhances efficacy. The erection takes about 10 minutes to develop and the dose range varies between 125 and 1000µg. I find most patients get good results from 550µg and occasionally 1000µg.

In clinical trials about 43 per cent of patients who tried MUSE were able to have intercourse at least once with this treatment but, as with other invasive methods, there is a high dropout rate.

The most common side effect is penile pain (30 per cent), urethral burning (12 per cent) or minor urethral bleeding (5 per cent). Systemic side effects are uncommon.

For those patients who elect to use MUSE, I usually administer the first dose in my rooms. I make sure the patient knows exactly what to do, and it also gives me an idea of its efficacy and whether to adjust the dose. I also give these patients a video (available from the pharmaceutical company) which takes the patient through the application process step by step.

c. Vacuum devices

This treatment form has the merit of being non-invasive. The disadvantage is it requires some degree of skill in handling, and applying the treatment can take some time. They should only be used for 30 minutes at a time, and usually require a willing and cooperative partner. These devices create a

vacuum around the penis and blood is drawn into the corporal spaces. A band is slipped off the plastic cylinder around the base of the penis to maintain penile tumescence without rigidity in the crura.

There are few side effects, although there is some degree of discomfort and the

penis feels cold. Ejaculation is usually blocked and some men find this makes orgasm less satisfactory. Bruising can occur in 10–15 per cent of men.

Vacuum devices are useful in older men with stable relationships and where other treatment options are contraindicated or less effective. They may also be used to enhance the result of pharmacotherapy.

The use of a constrictive ring without the involvement of a vacuum device has been effective in some men to augment the effects of pharmacotherapy.

d. Intracavernosal injection therapy

Intracavernosal injection therapy was started in 1982 by Dr Vigna when he used papaverine to initiate the erection process in men suffering from erectile dysfunction.

Self-injection therapy requires some specialist knowledge by the treating doctor, who must also be skilled in treating priapism should it occur. This treatment used to be regarded as the standard one for erectile dysfunction and it was used for both diagnostic and therapeutic reasons.

Patients need to be taught how to perform self-injection, and the dose needs to be calculated carefully to avoid prolonged erections. I teach my patients by demonstrating on a latex model, and once again make use of videos. I encourage them to use an auto-injector, as most find it difficult to insert the needle into the appropriate site in the corpus cavernosum.

In order to calculate the dose and consider which of the different combinations to use, I administer a standard test dose to all my patients. I also perform a vascular Doppler on the dorsal penile artery before, and 15 minutes after, giving the test dose.

Erection occurs after 10 minutes and may be enhanced by sexual stimulation.

The incidence of complications varies with the different pharmacological agents; some pain is not uncommon, but long term complications are limited to priapism and/or penile fibrosis.

Drugs for intracavernous injection

Alprostadil: This is the most widely used agent. It is effective in 70–80 per cent of patients and has a low incidence of side effects. Penile pain occurs in 15–50 per cent of patients but is often not severe enough to discourage intercourse. The dose range is 5–20µg but I sometimes increase it further, or use a combination with papaverine and or phentolamine.

Priapism occurs in about 1 per cent of cases.

Papaverine: This was the first agent for general use. It always pays to use this drug in combination therapy because of its high incidence of priapism if used in high doses on its own. It also has the ability to cause penile fibrosis if used over a long period of time.

Papaverine and phentolamine mix-ture: This is still used in many countries. It is more effective than papaverine alone and the chance of developing priapism is less than with papaverine alone.

Trimix (papaverine, alprostadil, phentolamine): This mixture was introduced to treat those patients who responded poorly to papaverine alone or in combination with phentolamine or alprostadil alone.

e. Surgery

Surgery is rarely performed these days as a treatment for erectile

dysfunction. The following are indications for surgery:

1. Arterial reconstruction in young men under the age of 40 with a proven post-traumatic arterial lesion on a selective angio-gram and with no risk factors such as smoking, hypertension or diabetes. The inferior epigastric artery is rerouted and anastomosed with the dorsal penile artery/vein. Careful selection of patients gives a 65 per cent one-year success rate.
2. Surgery for veno-occlusive dysfunction. This is sometimes successful in cases of congenital focal abnormalities, but has a low success rate in the presence of vascular risk factors.
3. Penile prosthesis. This type of surgery is only indicated in a select group of patients who fail to respond to any of the less invasive treatment options. A prosthesis does not restore a normal erection, but makes the penis rigid enough for sexual intercourse.

CONCLUSION

Men with erectile dysfunction should be encouraged to seek medical advice. Erectile dysfunction is more common in men over the age of 40 with risk factors such as chronic illness, pelvic trauma, pelvic surgery, alcohol abuse, cigarette smoking, systemic atherosclerosis and diabetes.

There are various treatment forms available and the list of options will increase in the near future.

Most patients would prefer to regain the ability to have a normal, spontaneous erection. This is only possible when the problem is mainly psychological, drug-related or hormonal.

All patients can benefit from counselling and it is also important to remember some patients prefer the option of a satisfactory non-penetrative sexual relationship.

It is customary to start with non-invasive therapy, and limit the more invasive forms of treatment to those with specific indications.