Erectile Dysfunction, had replaced the term impotence approximately a decade ago, is consistent or recurrent inability to achieve and maintain rigid penile erection sufficient to permit sufficient/satisfactory sexual intercourse. Male sexual process involves an intact libido, ability to achieve & maintain erection, ejaculation and detumescence (flaccidity). Erection process is a neurovascular phenomenon. ED has three basic mechanisms namely failure to initiate (psychologic, endocrinologic or neurogenic), failure to fill (arteriogenic), failure to store blood within lacunar network (venous leak). Worldwide about 100 million are estimated to suffer from ED. 50% of men with diabetes, 40% of men with CAD and 90% of men with severe depression suffer from ED. Loss of libido is a loss of sexual desire and often due to psychological cause; this may in turn lead to ED. From patients attending to endocrinology clinics, erectile dysfunction is markedly under-diagnosed entity. “Sexily well is healthily well” is a good saying.

GENERAL CONSIDERATIONS

Etiologies may be hormonal (hypogonadism), psychological, vasculogenic (atherosclerosis), neurogenic (autonomic), or drug related. DM, HTN, CVD & depression; diabetes accounting for 40%, vascular disease 30% of organic causes. We are in era of DM, HTN, Obesity, Metabolic Syndrome etc., and endothelial dysfunction occurs resulting in ED. Penile arteries are just half the size of coronaries and like coronaries they undergo atherosclerosis. Endocrine causes are rare except diabetes. Diabetes Mellitus as a cause for ED is due to autonomic neuropathy, vasculogenic, drug induced and often mixed. Atherosclerosis of internal pudendal arteries is a common aetiology particularly in smokers. The presence of early morning erections, nocturnal emissions rules out endocrine causes, psychologic causes. ED due to hypogonadism is excluded by normal testosterone, gonadotrophin, and prolactin levels.

Many drugs (prescription and non-prescription) cause ED like beta blockers, thiazide diuretics, antiandrogens, anti-cholinergics, anti-depressants, estrogens, ranitidine, metoclopramide (“beware of drugs”). Psychogenic ED is frequently a diagnosis of exclusion; psychogenic persons will have nocturnal erections of adequate frequency and rigidity. Almost all patients with ED, even when it has a clear-cut organic basis, develop psychogenic component as a reaction to ED.

Over the past several years, population-based surveys have shown that ED is an increasingly common condition in aging men & aging is one of the primary factors associated with increasing incidence of ED. Age-related decline starts in 5th decade and this is known as Androgen Deficiency in Aging Men (ADAM) or andropause. Approximately 52% of men...
aged 40-70 years experience this disorder.

**DIAGNOSIS**

Diagnosis is mainly by history. History remains one of the most important tools for elucidating diagnosis and cause of ED. It is important to be able to discuss freely & frankly with patient/partner. Adequate time/privacy must be set aside for a full interview. History will disclose loss of desire for sex, erectile dysfunction, premature ejaculation, retrograde ejaculation, retarded ejaculation/anejaculation, delayed orgasm/impotence. Thorough medical history includes ability to have erections while masturbating vs. erections with partner, list of all prescriptions (over-the-counter & herbal medications), knowledge of nocturnal erections (wet dreams), frequency of intercourse, ability to ejaculate, tobacco abuse, alcohol abuse, drug abuse.

“Be a good listener”.

Evaluation of medical risk factors such as diabetes, hypertension, CAD, obesity, lifestyle risk factors that include smoking, alcohol, drug use elicited. Surgical history - emphasis on bowel, bladder, prostate, vascular surgery taken. Focused physical examination on genitalia (undescended testis, size of testis, hypospadiasis, secondary sexual characters, Peyronie’s disease), prostate, lower extremity circulation, neurologic examination (anal sphincter tone, bulbocavernous reflex, testing for peripheral neuropathy) etc.

**LABORATORY TESTS**

1. **Primary level evaluation** - Total testosterone assay (early morning sample), fasting blood sugar, post prandial blood sugar, fasting lipid profile, PSA (in elderly), thyroid profile.
2. **Secondary level evaluation** - Free testosterone, prolactin, gonadotropins (LH, FSH).
3. **Tertiary level evaluation** (rarely employed) - Direct injection of vasoactive substances like PGE-1, papaverine or combination of drugs intracavernosally will induce erections in men with intact vascular systems; Penile Doppler ultrasound; Nocturnal penile tumescence & rigidity testing; Dynamic Infusion Cavernosometry & Cavernosography (DICC); Pudendal arteriography. These tertiary level tests are available in advanced centres but are indicated in select patients only.

**TREATMENT**

**Life style changes:** Quitting smoking, reducing stress (meditation), minimization of alcohol use, reduction of obesity, regular exercises and yoga (exercises raise serotonin and beta-endorphin levels, which boost energy and give a feeling of well-being). Yoga is a golden gift given by India to Western World. Modify the modifiable.

Treatment of specific endocrinologic conditions, particularly diabetes, hypogonadism etc., Careful search for drugs causing ED made and withdrawn the offending drug.

**Drug therapy:** Phosphodiesterase type-5 inhibitors (sildenafil, tadalafil, vardenafil) are usually first line of therapy (vasoactive therapy). Avanafil, a new PDE-5 inhibitor is in phase 3 trials. They all increase penile blood flow (Nitric oxide produced by the enzyme nitric oxide synthase is released from endothelial cells and cavernous nerves and stimulates guanyl cyclase, resulting in increased levels of cyclic guanosine monophosphate (cGMP). Subsequent phosphorylation of cellular membrane proteins via protein kinase G results in an efflux of calcium, which leads to smooth-muscle relaxation, vasodilatation of the penile arteries and penile sinus, and erection. PDE-5 inhibitors decrease the breakdown of cGMP, resulting in the prolonged high levels of cGMP necessary for erections). Sildenafil (the ‘blue pill’) for heart condition was first used to dilate coronary vessels for angina. The results were disappointing, until doctors have found an extraordinary side-effect among male volunteers namely penile erection. Sildenafil, introduced in April 1998, is first oral pill effective for ED. Sildenafil allows for erection with sexual arousal; should be taken an hour prior to sexual activity. Sildenafil dose is 25-100mg (most often 50mg); duration of action lasts 4-6 hours; effective in 50-90% of patients. PDE-5 inhibitors cause flushing, headaches, GI disturbances, nasal congestion and visual blue haze (cross-reactivity with PDE-5 in retina). All PDE-5 inhibitors are similarly effective but have variable half-lives, receptor affinity, and side-effects. Each drug is initiated at lowest dose and titrated upward to effect. Priapism as a side-effect of vasoactive therapy is exceedingly rare. All PDE5 inhibitor drugs are contraindicated in patients receiving nitric oxide donors like nitroglycerin/nitrates because of risk of severe hypotension. Caution also exercised prescription of PDE-5 inhibitors in ischemic heart disease patients because the unaccustomed stress of sexual activity may precipitate cardiac ischemia/dysrhythmia. Do not prescribe PDE-5 inhibitors to patients with unstable CAD who need nitrates.

PDE-5 inhibitors may not work in DM because of preexisting endothelial dysfunction.

30% of patients don’t respond to PDE-5 inhibitors and patients who fail to respond to one PDE 5 inhibitor may not respond
to others also. Apomorphine, a potent emetic that acts on central dopaminergic receptors D1 and D2, stimulation of above D1 and D2 receptors transmits excitatory signals down spinal cord to sacral parasympathetic nucleus, stimulating activity of sacral nerves supplying penis. Apomorphine injection produce 100% erectile response, but nausea & vomiting are limiting factors to this mode of administration. Apomorphine sublingually 0.2 and 0.3 mg produce 67% erectile response. Sublingual apomorphine dissolve rapidly and being lipid soluble readily cross blood brain barrier and result in erection within 20 minutes, if there is a sexual stimulation in that period. Apomorphine is nearly ineffective if swallowed. Apomorphine is a new promising centrally acting drug, particularly in atherosclerotic aetiology. Apomorphine side-effects are mild nausea, dizziness and rarely syncope. No cardiac death reported with Apomorphine. Apomorphine to be used with caution in decreased kidney and liver function, elderly people and in patients with H/O of hypotension. Advances in understanding of physiology of erections have enabled these more effective oral treatments.

For documented androgen deficiency cases testosterone replacement therapy offered. Testosterone injection 100 to 200 mg i.m. every 2 weeks on average; transdermal testosterone patches (5 mg/d); oral testosterone capsules 40 mg/d can be given but has the potential for hepatotoxicity.

**Second line of management** is with Vacuum Constriction Device (VCD), self-administered intracavernosal injection of Alprostadil, transurethral Alprostadil gel (Medicated Urethral System for Erection - MUSE).

**Third line of management (usually for refractory ED)** is with prosthetic penile implants (either of fixed malleable rod or inflatable reservoir).

**Vascular Reconstruction**: Patients with disorders of arterial system are candidates for arterial reconstruction, including endarterectomy, balloon dilatation and arterial bypass surgery. For venous leak patients ligation of deep dorsal or emissary veins is advocated. Experience with vascular reconstructive procedures is still limited.

If psychologic reason is established psychosexual counselling/psychotherapy is advocated; this often includes couple counselling.

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