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# Erectile Dysfunction: An Update

**Saurabh Nimesh*, Ravi Tomar, Manoj Kumar, Nitish Tyagi, Piyush Kumar Shukla**

*Department of Pharmaceutical Technology, Meerut Institute of Engineering and Technology, NH-58 Baghpat Crossing Bypass, Meerut, Uttar Pradesh, INDIA.*

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***Correspondence to:**

***Mr. Saurabh Nimesh, M. Pharm. (Pharmacology)***

*Email: nimeshmiet@gmail.com*



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Abstract

Erectile dysfunction or Sexual dysfunction or male impotence is defined as the inability of a man to achieve and maintain an erection sufficient for mutually satisfactory intercourse with his partner. Sexual health and function are important determinants of quality of life. ED is a significant and common medical problem. An estimated 150 million men worldwide have some degree of ED, and more than twice that many are expected to be affected by 2025. Several orally active drugs Apomorphine sublingual, Sildenafil, Vardenafil, Tadalafil and Avanafil are currently prescribed for the treatment of ED to improve the arterial blood flow to the penile tissue. Herbal medicinal plants and their extracts have been used in traditional medicine in treatment of ED. These herbal medicinal drugs are including Ginseng, Ashwagandha, Yohimbine, Safed musli, Shilajit, Ginkgo. The present review provides an overview of the knowledge of ED or sexual dysfunction at the time.

Key words: Sildenafil, Corpus cavernosum, Libido, Nitric oxide, Androgen.

## INTRODUCTION

The National Institutes of Health Consensus Development Conference on Impotence (7 December 1992) has defined Erectile dysfunction (ED) or impotence as the 'inability to achieve and maintain a penile erection adequate for satisfactory sexual relationship'.[1] Male sexual dysfunction may be manifested in a variety of ways and the history is critical to the proper classification and subsequent treatment. Androgens have a strong influence on the sexual desire of men. A loss of libido may indicate androgen deficiency on the basis of either hypothalamic, pituitary or testicular disease.[2] This definition better encompasses the full spectrum of activity that is affected by ED (Figure 1), as opposed to definitions considering only vaginal penetration. Sexual health is an important determinant of quality of life.[3] Today, millions of men (young and old) suffer from ED due to high levels of synthetic hormones (known as Xenoestrogens) in our diet/environment, nutritionally imbalanced diet resulting from poor quality of produces and extremely low levels of testosterone. ED is a pervasive problem among men worldwide. According to World Health Organization 'Sexual health is fundamental to the physical or emotional health and wellbeing of individuals, couples and families and to the social or economic development of communities and countries'.[4] ED affects the quality of life for both patients and partners and is associated with relationship difficulties (Figure 2).[5-8]

## Epidemiology

ED is a significant and common medical problem. An estimated 150 million men worldwide have some degree of ED (Figure 3) and more than twice that many are expected to be affected by 2025. Recent studies suggest that approximately 10% of men aged 40 to 70 have severe or complete ED, defined as the total inability to achieve or maintain erections sufficient for sexual performance.[9] An additional 25% of men in this age category have moderate or intermittent erectile difficulties. The disorder is highly age dependent, as the combined prevalence of moderate to complete ED rises from approximately 22% at age 40 to 49% by age 70. Although less common in younger men, ED still affects 5 to 10% of men below the age of 40. Findings from these studies show that ED impacts significantly on mood state, interpersonal functioning and overall quality of life (Figure 4).[10-13]

## Mechanism

The proper functioning of the sexual apparatus is dependent not only on its nervous and muscular integrity, but also on the endocrinal and psychic factors.[14] Other systems of the body are complementary and their disorders

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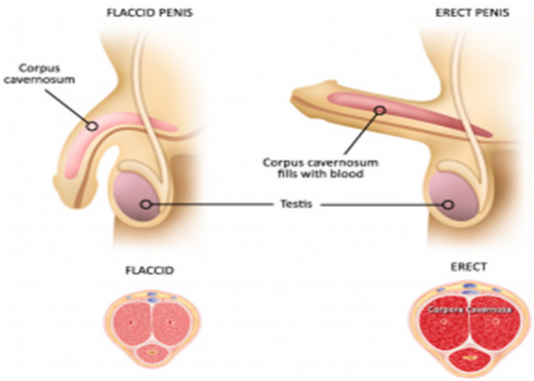


**Figure 1: Spectrum of Erectile dysfunction.**

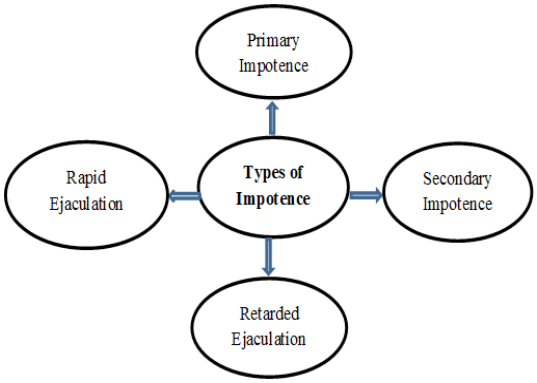


**Figure 2: Types of erectile dysfunction..**

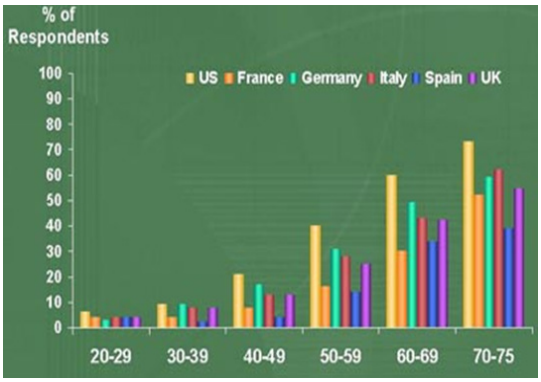


**Figure 3: Erectile dysfunction prevalence by age and country.**

may ultimately affect this phenomenon, causing ED. Thus, erection is a complex, involuntary, neuropsychological, hormone mediated vascular event that happens when blood flows rapidly into the penis and becomes trapped in its spongy chamber (Figure 5). Its precise erudition may add to the comprehension of the physiological phenomenon, comprising libido, erection, copulation, orgasm and the ejaculation.[15,16]

## Erection

The preceding activities of the nerve endings cause dilatation of arterioles by relaxing their smooth muscle coat, which in turn causes filling of the spaces of corpora cavernosa resulting in its expansion. Accordingly, strong pressure is exerted on the veins that normally drain blood from the penis. The pressure is adequate to close the veins thus trapping the blood in the

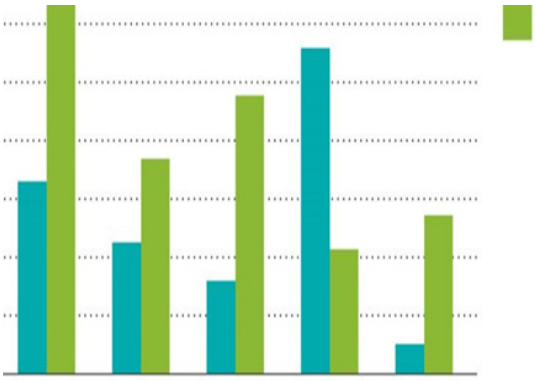

**Figure 4: Prevalence of sexual dysfunction (difference in problems reported by men and women).**

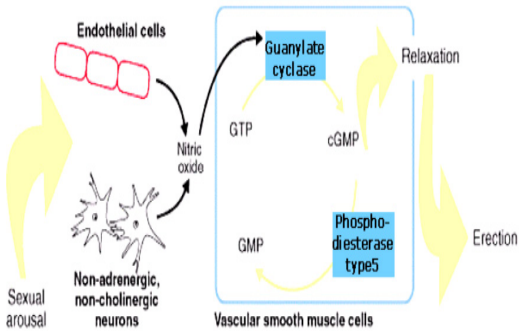


**Figure 5: Mechanism of erection.**

penis. The result is the thickening, rigidity and elongation of the penis. An erector muscle of the penis (ischiocavernosus) draws the penis forward and makes it well adapted for penetration of the vagina.[17]

## Orgasm and Ejaculation

Friction between the glans penis and vaginal mucosa, reinforced by several other afferent stimuli and psychogenic factors, causes a reflex discharge along the sympathetic to the seminal pathway, the muscle coats of the epididymis, ductus deferens, the seminal vesicles and the prostate gland. The sperm, along with the secretion of the accessory glands, are discharged into the posterior urethra, between the internal and external sphincter of the bladder. After orgasm is reached, the rhythmic contractions of the bulbocavernous and ischiocavernous muscles ejaculate the semen through the penis into the vagina. Sympathetic nerves, which act as a motor to the seminal tract, simultaneously close the internal vesicle sphincter and thus prevent a reflex of semen into the bladder. Further, the contraction of detrusor vesicae and the associated inhibition of constrictor vesicae prevent a simultaneous discharge of urine.[18]

### *Libido*

The cerebral cortex is the chief controlling focus of the sex apparatus. Libido is the conscious feeling of the sexual urge, which originates in the brain center through the impulses received by various sense organs. In the event of aroused libido, the brain center sends impulses to the spinal center, which in turn passes them expeditiously to the peripheral nerves of the penis.[19]

### *Copulation*

After the penis is inserted in the vagina, an act of sexual intercourse or

copulation takes place and continues until the time of orgasm and subsequent ejaculation.[20]

### *Detumescence*

After ejaculation and cessation of exotic stimuli, sympathetic tonic discharge resumes, this results in the contraction of smooth muscles around sinusoidal spaces and arterioles. Arterial flow is diminished to flaccid levels, much of the blood from sinusoidal spaces is expelled and the venous channels are restored.[21]

## Aetiology

Many factors can affect a man's ability to get and keep an erection (Figure 6), drug also that may cause and contribute to ED (Table 1).[22,23]

## Sign and Symptoms

The genitalia should be examined, noting the presence of penile scarring or plaque formation (Peyronie's disease) and any abnormalities in size or consistency of either testicle. Examination of the prostate is essential (Figure 7).[24]

## Laboratory findings

Laboratory evaluation is limited and should consist of a complete blood count, urinalysis and lipid profile, determination of serum testosterone or prolactin. Patients with abnormalities of testosterone or prolactin require further evaluation with measurement of serum follicle-stimulating hormone and luteinizing hormone and endocrinologic consultation is advised.

## Treatment

The vast majority of men suffering from ED can be treated successfully with one of the approaches outlined below. Men who do not suffer from organic dysfunction will probably benefit from behaviourally oriented sex therapy (Table 2).[25] The herbal medicinal plants have been traditionally used for the treatment of ED or sexual dysfunction (Table 3).[26]

**Table 1: Drugs causing and contributing to ED.**

| S. No. | Drugs |
|---|---|
| 1 | Antiparkinson |
| 2 | Anticonvulsants |
| 3 | Cytotoxic agents |
| 4 | Analgesics |
| 5 | Alcohol, nicotine and illicit drugs |
| 6 | Antihypertensives |
| 7 | Diuretics |
| 8 | Antipsychotics |

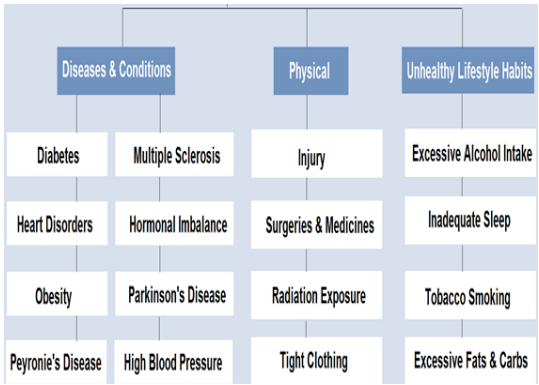


**Figure 6: Physiological causes ED.**

**Table 2: Allopathic treatment for ED.**

| S. No. | Allopathy therapy | Side effect |
|---|---|---|
| 1 | Sildenafil | Warmth or redness in the face, neck or chest, memory problems and upset stomach |
| 2 | Tadalafil | Flu-like symptoms (such as stuffy nose, sneezing or sore throat), Sudden decreased vision and low blood pressure |
| 3 | Vardenafil | Nausea, sweating, general ill feeling, irregular heartbeat, swelling in your hands, ankles or feet and shortness of breath |
| 4 | Avanafil | Bronchitis, joint pain, high blood pressure and an erection that will not go away (priapism) |
| 5 | Apomorphine sublingual | Nausea, dizziness, severe sweating and drowsiness. |
| 6 | Lidocaine-prilocaine cream | Redness, swelling, tingling/burning and lightening of the skin |
| 7 | Vacuum constriction devices | A black and blue mark or small area of bruising on the shaft of the penis. |
| 8 | Intracavernous and intraurethral therapy | Hypotension, reflex tachycardia, nasal congestion and gastrointestinal upset |
| 9 | Penile prostheses | Injury to a vein or artery of lower extremity, mechanical failure of the implant, severe pain (temporary) in the surgical area |

**Table 3: List of herbal medicinal plants.**

| S. No. | Biological name | Family | Common name | Part used |
|---|---|---|---|---|
| 1 | *Panax ginseng* | *Araliaceae* | Ginseng | Root |
| 2 | *Withania somnifera Linn.* | *Solanaceae* | Ashwagandha | Leaf and root |
| 3 | *Chlorophytum tuberosum Baker.* | *Liliaceae* | Safed musli | Whole plant |
| 4 | *Asphaltum bitumen* | --- | Shilajit | Pitch |
| 5 | *Ginkgo Biloba* | *Ginkgoaceae* | Ginkgo | Leaf and seeds |
| 6 | *Pausinystalia yohimbe* | *Rubiaceae* | Yohimbine | Bark |
| 7 | *Dactylorhiza hatagirea* | *Orchidaceae* | Salem panja | Root |
| 8 | *Asparagus racemosus* | *Liliaceae* | Shatawari | Root |
| 9 | *Fadogia agrestis Schweinf. Ex Heim* | *Rubiaceae* | Black aphrodisiac | Stem |

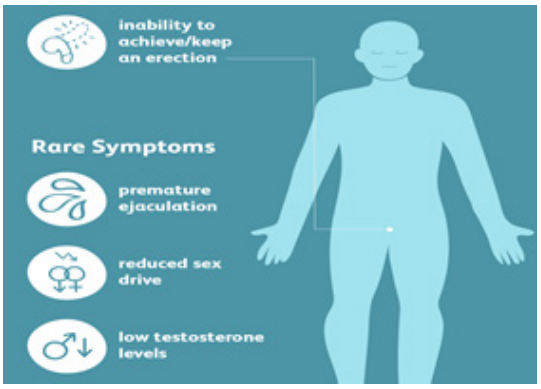


**Figure 7: Symptoms of ED.**

## CONCLUSION

Sexual problems are related to sexual desire and male ED. Successful treatment of ED or sexual dysfunction may improve not only sexual relationships, but also the overall quality of life. Thus, this review has dealt with various approaches by which the screening of Allopathic drug and herbal medicinal plants can be achieved. The rationale for the use of these medicines is based on the speculation that some forms of male infertility are caused by oxidative insult and hormonal imbalance and the use of oriental medicine may improve male fertility potential and semen quality.

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## CONFLICT OF INTEREST

The Authors declare that there is no conflict of interest.

## ABBREVIATIONS

**ED:** Erectile Dysfunction, **WHO:** World Health Organization.

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