# Sexual Dysfunction and Infertility

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*"Sex is a natural function.*
*You cannot make it happen, but you can teach people to let it happen".*

William H. Masters

## Introduction

Human sexuality is an enigma, regulated by a byzantine interplay between vascular, endocrine, and neurological systems. Both fertility and sexuality share the same anatomical structures, and a problem in one center may lead to a problem in another. They have independent but interdependent physiological pathways. Human sexuality is woven into the very fabric of human existence; for some, sexual interest and encounters may be brief, and for others it may lead to a start of new relationship, culminating in the start of a new family and reproduction [1]. Sexuality is also influenced by an individual's societal, religious, personal, and cultural beliefs and undergoes significant change with the health status of the concerned individual. Each partner of a couple brings in diverse sexual needs, attitudes, and beliefs; hence a breakdown in any one of these areas ultimately would result in sexual dysfunction.

Giving a comprehensive update on all management strategies for the various sexual dysfunctions in an infertility setting is beyond the scope of this review, but

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on the other hand the aim of this chapter is to briefly highlight the complexities involved in managing a patient with sexual dysfunction and to also give the reader a few basic treatment strategies that could be utilized in a primary care setting.

A recent interest and upsurge of research into the field of sexual medicine can be attributed to the earlier pioneering work of Masters and Johnson, who are frequently considered as pioneers in the field of sexual dysfunction. They studied 10,000 complete cycles of sexual response, by observing close to 790 couples including homosexuals [2]. In their book titled "Human Sexual Inadequacy," these authors describe in depth the diverse presentations of the various sexual dysfunctions, along with their management [3].

## Sexual Dysfunctions: Definition and Classification

Sexual dysfunctions are becoming increasingly common; a lack of large-scale epidemiological studies to accurately assess the exact prevalence of sexual dysfunctions is seen in the scientific literature. However, perusal of data from numerous smaller studies suggests that, in the age groups between 18 and 59 years including both men and women, approximately 43 and 31% of men and women experienced at least one symptom of sexual dysfunction. Disparate patterns of sexual dysfunction are also seen among different ethnic groups. The severity of dysfunction also varies as a function of the patient's age and educational attainment [4].

A sexual dysfunction is a problem that can potentially interfere with the initiation, and/or consummation, and/or satisfaction with sex. They can afflict either the male or the female partner in a coupling. Disorders of sexual function are independent of sexual orientation and can potentially impede any of the four phases that encompass the human sexual response cycle, i.e., the phases of desire, excitement, orgasm, and finally resolution. These disorders can ultimately lead to anxiety, depression, and feelings of inadequacy for both partners. A dysfunction can be stratified as being either lifelong and always present, recently acquired, or generalized or situational. The popularly used DSM-4 (Diagnostic and Statistical manual of Mental disorders) criteria for the classification of dysfunction was modeled along the lines of the work done by Masters and Johnson [5] and further by Kaplan [6]. The manual was published in 1994 and reflected the general scientific knowledge and thinking generated in publications at that point in time [7]. However recent findings have questioned the validity and general applicability of the DSM-4 classification of sexual dysfunction. The latest DSM-5 manual published in May 2013 clearly states that a diagnosis of sexual dysfunction should only be made if the dysfunction has lasted for a *minimum of 6 months* and if the frequency of dysfunction is seen in *75–100% of sexual encounters*. Furthermore the dysfunction should have caused *considerable distress* to the couple [8]. In addition to the scale of classifying a sexual dysfunction disorder as lifelong, generalized, or situational; the disorder is also classified as being mild, moderate, or severe [8]. Revised classification of various disorders is given in Table 5.1.

A very significant change in the revised classification of sexual dysfunction as per the DSM-5 is the inclusion of dyspareunia and vaginismus as a single entity titled

**Table 5.1** Various changes in the classification of both male and female sexual dysfunction as per the DSM-5 revised classification system

| DSM-4 diagnosis | Revised DSM-5 diagnosis |
|---|---|
| *Male dysfunctions* | |
| Male erectile disorder | Now listed as erectile disorder |
| Hypoactive sexual desire disorder | Unchanged |
| Premature ejaculation | Unchanged |
| Male orgasmic disorder | Now changed to delayed ejaculation |
| Male dyspareunia | Not listed |
| Male sexual pain | Not listed |
| *Female dysfunctions* | |
| Female hypoactive desire | Integrated into female sexual interest/arousal disorder |
| Female arousal disorder | Integrated into female sexual interest disorders |
| Female orgasmic disorder | No changes |
| Dyspareunia | Now called genito-pelvic pain or genito-pelvic penetration disorder |
| Vaginismus | Now called genito-pelvic pain or genito-pelvic penetration disorder |
| *Other causes leading to a dysfunction* | |
| Sexual aversion disorder and sexual dysfunction attributable to a general medical condition | Deleted because of a lack of evidence |
| Sexual dysfunction due to drug abuse | Unchanged |

genito-pelvic pain disorder, since there is a remarkable degree of similarity in the way these dysfunctions manifest, as suggested by a large body of empirical evidence [9]. The diagnosis of male dyspareunia has been scrapped due to the extreme rarity of the condition. Not much change has taken place in the classification of male sexual dysfunction. Sexual aversion disorders as a separate classification has been deleted, since these aversion disorders frequently coincide symptomatically with phobias and/or anxiety disorders.

## Diagnosing a Sexual Dysfunction in an Infertility Setting

Sexual dysfunction can have an organic or a psychogenic etiology; however caution is advised, as all organically induced dysfunction would have some degree of overlap involving a psychological component. Most of the time in a clinical setting, finding a mixed etiology is not uncommon. In an interesting case-control study on 119 women with infertility, using 99 women (age group 18–45 years) of proven fertility as controls, patients with infertility were found to have significantly ($p < 0.05$) lower scores, in not just the desire and/or arousal responses, but also in the lower frequency of intercourse and masturbation. Scores from sex life satisfaction were also reduced after a diagnosis of infertility was made, while the scores were equal to control before the diagnosis [10]. In another study, where a

demographic survey was done among 121 infertile couples presenting to an infertility setting, about 22% of men reported mild-to-moderate erectile dysfunction and about 23% reported some degree of depression [11]. What this means is that infertility can lead to some form of sexual dysfunction, *but* the vice versa is also true since about 10% of patients presenting to an infertility clinic suffer from primary infertility due to sexual dysfunction [12]. In our clinic, of the 544 male partners of couples who presented for an infertility evaluation between February 2014 and January 2015, about 13% of the men suffered from some form of sexual dysfunction (Table 5.2). *Infertility can be both a cause and a consequence of a sexual dysfunction*, although much larger studies are required to validate this statement.

Infertility can create a situation of "sex on demand" and can drain the patient of their satisfaction in their sex lives (Fig 5.1). "Sex-on-demand" situations arising in an infertility setting include collecting a semen sample for sperm preparation and

**Table 5.2** 72 of 544 patients, between February 2014 and January 2015, presented with sexual dysfunction at our clinic

| Sexual dysfunction | No. of patients |
|---|---|
| Erectile dysfunction only (ED) | 27 |
| Anejaculation with ED | 2 |
| Premature ejaculation (PE) with ED | 2 |
| Decreased libido with ED | 9 |
| Infertility with ED | 6 |
| Dyspareunia | 2 |
| Sexual concern | 6 |
| Ejaculatory disorders | 18 |
| **Total** | **72** |

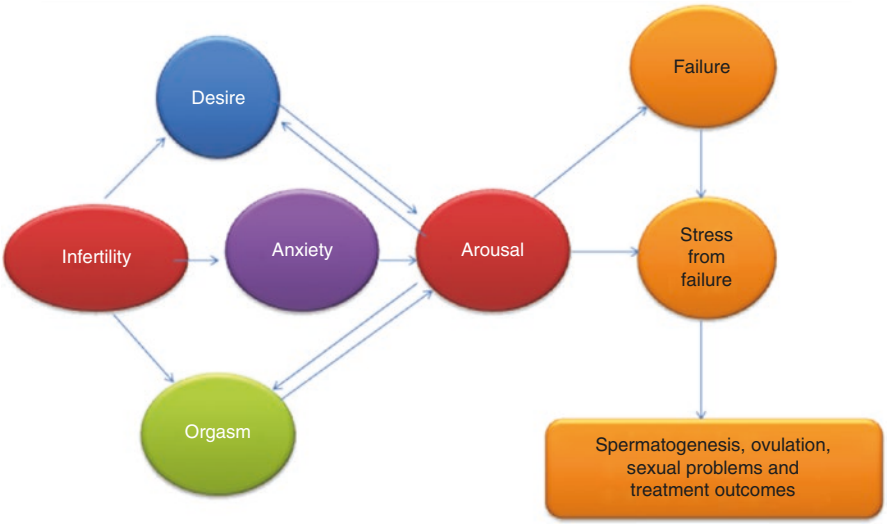


**Fig. 5.1** Infertility and the vicious cycle of sexual dysfunction

**Table 5.3** Various possible causes of both male and female sexual dysfunctions

| Male sexual dysfunction: associated medical conditions | Female sexual dysfunction: associated medical conditions |
|---|---|
| Cardiovascular disease | Genito-pelvic pain syndrome |
| Diabetes mellitus | Recurrent cystitis |
| Dyslipidemia | Vulvar dystrophy |
| Metabolic syndrome | Vulvar vestibulitis |
| Obesity | Bartholinitis |
| Smoking/alcohol consumption/recreational drug use | Episiotomy scars and strictures |
| Hypogonadotropic hypogonadism | Endometriosis |
| Hyperprolactinemia | Chemotherapy and/or radiotherapy |
| Hyper- and hypothyroidism | Hyperprolactinemia |
| Surgeries like radical prostatectomy | Neurogenic disease |
| Radiotherapy and/or chemotherapy | Obesity |
| Neurogenic disease | Surgeries like hysterectomies |
| Spinal cord injury | Breast cancer |
| Stroke | |
| Chronic renal failure | |
| Surgery of the urethra | |
| **Drug-induced sexual dysfunction** | **Drug-induced sexual dysfunction** |
| *Psychotropic medications* | *Psychotropic medications* |
| Neuroleptics | Antipsychotics |
| Barbiturate and benzodiazepines | Barbiturate and benzodiazepines |
| SSRI | SSRI |
| Antidepressants | Antidepressants |
| *Cardiovascular and antihypertensive drugs* | *Cardiovascular and antihypertensive drugs* |
| Statins | Statins |
| Fibrates | Fibrates |
| Beta-adrenergic blocking agents | Beta-adrenergic blocking agents |
| Clonidine | Clonidine |
| Digoxin | Digoxin |
| Diuretics | Diuretics |
| H2 receptor antagonist | |
| Proton pump inhibitors | *Hormonal preparations* |
| | Danazol |
| | GnRH agonists |
| | Oral contraceptive pill |

consequent intrauterine insemination (I.U.I.) on a specific day (i.e., if the said patient has difficulty in collecting a sample by masturbation), or having intercourse during a monitored natural cycle on a particular day of expected ovulation, or collecting a semen sample on demand for a simple semen analysis. Procreation in these cases then becomes the order of the day. The treating specialist should understand the situation and should be empathic and sensitive to the needs of the patient. Questions asked to elicit a sexual history should be direct but not repulsive; a careful choice of words and being empathetic at all times is the key to a successful history taking.

A proper history should elucidate responses pertaining to the couple's frequency of intercourse in the number of days per week and also the frequency after the dysfunction occurred; moreover the couple's sexual response cycle should also be completely assessed and charted, independently for both the male and female. A history of any associated medical illness and their treatment, substance abuse, and pattern of work hours including sleep should be elucidated by the treating physician (Table 5.3). A complete physical examination should follow the history taking. One must also assess if the sexual dysfunction in question is specific to a particular partner, a particular situation, or a circumstance. If this is the case, it is called situational dysfunction. An example would be this: Masturbation is normally a pleasurable exercise but it becomes a ritual and embarrassing when it has to be done in the hospital, laboratory, or toilet. The effect is confounded, when the male patient has to collect the entire ejaculate into a container. In another example, as a part of an infertility management, the couple has to be in a constant state of vigilance regarding ovulation to correctly time intercourse. The female partner then may lose interest in intercourse outside of the fertile period, and then male partner may develop an erectile dysfunction due to the *stress on demand situation* created on the day of ovulation. Another important point of clinical interest is that, one sexual dysfunction may frequently mask or exacerbate another dysfunction due to an interdependence seen between sexual dysfunctions. For example, a women who may be primarily diagnosed with genito-pelvic pain disorder (previously called vaginismus) could affect her partner's erection leading to secondary erectile dysfunction that occurs because the male is afraid that he may cause his partner pain during attempted penetration. In another example, a patient may complain of decreased desire, but this could have secondarily developed due to inadequate foreplay leading to inadequate lubrication resulting in unsatisfactory sex. The primary problem here lies in the male partner who had not adequately aroused his female partner.

One must direct questions in such a way so as to elucidate what he/she thinks/assumes could be causing the problem. Some other useful questions are given below:

- Has your fertility problems afflicted your sexual life?
- What has changed in your sexual life since you started trying for a pregnancy?
- How best can you describe your sex life/sexual activity?
- How frequently do you have penetrative sex?
- How is your interest in sex?
- Do you have any problems with erection and ejaculation?
- Do you feel guilty about having sex?
- Do you feel sex is a sin?
- Do you engage in sex outside your marriage?
- Have you experienced any trauma during sex?

Medical conditions can concomitantly affect sexual function either directly or indirectly [13–17]. For the couple, an in-depth history taking should comprehensively investigate the associated conditions listed in Table 5.2. Numerous

large-scale epidemiological studies have established a causal link between cardiovascular and metabolic status with sexual health for both men [18] and women [19]. The appropriate treatment and management of comorbid medical conditions with respect to their sexual implication may improve sexual performance. Numerous medications affect both male and female sexual function; appropriate dose adjustments, change in medications, and stopping substance abuse may also significantly improve sexual function.

## Basic Treatment Strategies for the Female

Management of a sexual dysfunction in an infertility setting involves utilizing an "amalgamated therapeutic strategy" which brings in a combination of an appropriate medical and surgical management, sex therapy, counseling, and marital therapy. Educating the patient on what is normal sexual function, sexual response cycle, and basic anatomy of the female genital tract would by itself allay certain doubts and the phobic fear of pain in certain patients presenting with genito-pelvic pain syndrome. Education followed by encouragement of nonsexual behavior will sensitize the patient with her partner. Advising patients to eliminate routine sexual behavior and encouraging the use of explicit sexual materials like books ands videos may also be of some benefit for a few patients [20].

The physician must assess whether the patient is comfortable in discussing her issues, and must also respect the patient's decision in the event she declines treatment. For some patients presenting with sexual dysfunction and infertility, the management of infertility is of more considerable importance than the sexual dysfunction itself. Appropriate counseling and support must be extended to such patients. Other treatment strategies for the female include the usage of lubricants, adopting different sex positions, and finally, but most importantly, Kegel's exercise which if done regularly would improve the strength of the pubococcygeus muscle and also improve the vaginal muscle tone [21]. The role of testosterone replacement therapies in women presenting with sexual desire disorders remains unproven and is not a recommended line of management [22].

## Basic Treatment Strategies for the Male

Basic treatment strategies for the male should also follow an amalgamated approach. The patient should be advised to stop smoking and alcohol consumption and is also advised strict weight reduction regime. Patients are also advised strict weight reduction along with lifestyle modifications because from a fertility viewpoint weight reduction has a positive impact on sperm and semen parameters [23] and also loss of body weight is associated with a counter rise in free testosterone, sex hormone-binding globulin, total testosterone, and FSH. This rise in endogenous hormones displays a robust reciprocal dose-response relationship with the degree of weight loss and weight gain as verified through extensive, large-scale interventional studies [24]. An increase in

endogenous testosterone would improve erection in obese patients presenting at baseline with erectile dysfunction [25]. Regardless of the etiology of erectile dysfunction, PDE-5 inhibitors have been advocated as the first-line therapy of choice for the management of erectile dysfunction by the European Medical Agency (EMA) [26]. All PDE-5 inhibitors require sexual arousal for erection to be achieved. Sildenafil is the most commonly used drug with a recommended starting dose of 25 mg. Adverse events reported are generally not severe and self-limiting with continuous use [27]. In a dose-response study, a significant improvement was documented in the erectile function among 56% of men who received 25 mg of sildenafil, 77% of men who received 50 mg of sildenafil, and about 84% of men who were started on 100 mg of sildenafil, following 24 weeks of therapy as compared to about 25% of men who were on placebo [28]. This study used standardized questionnaires to assess outcomes. The safety profile and the efficacy of sildenafil are well established in all subtypes of erectile dysfunction [29]. A cardiovascular assessment must be done before prescribing PDE-5 inhibitors. If the patient is on organic nitrate therapy, PDE-5 inhibitors are absolutely contraindicated. PDE-5s are absolutely contraindicated in the following conditions: (1) patients with a history of myocardial infarction, arrhythmia, or stroke in the preceding 6 months; (2) patients presenting with a resting blood pressure less than 90/50 mm of Hg or with diagnosed primary hypertension with blood pressure greater than 170/100 mmHg; and (3) patients with a past history of congestive cardiac failure, angina, or an attack of angina during sexual intercourse [26].

Although the medical management of erectile dysfunction is inveterate, the role of placebo in significantly improving erectile function deserves a special mention and cannot be ignored. In a randomized single-blind, prospective parallel group study, done on 123 patients with diagnosed ED, patients were randomly assigned into three groups and all three groups were given different forms of a placebo and the study reported a significant ($p < 0.001$) improvement in erectile function after 8 weeks of therapy [30].

The next most common dysfunction seen in an infertility setting is premature ejaculation (PE). No global concordance has been reached on the exact definition of PE; the European Urology Association (EUA) defines PE as the inability to control ejaculation for a sufficient length of time before vaginal penetration is achieved [31]. Selective serotonin reuptake inhibitors (SSRI) have been frequently used for the management of PE. Recommended management is by sexual counseling and behavioral techniques like start-stop and the squeeze-pinch method [32]. SSRIs are frequently combined with psychosexual techniques for managing PE.

An important mention must also be made of orgasmic anejaculation; here the commonest cause is retrograde ejaculation, where the semen instead of moving in an antegrade direction moves retrograde back into the bladder [32]. Common etiologies include diabetes mellitus, surgeries to the spinal cord, use of alpha-1 antagonist, and a few psychotropics; other causes include RPLND (retroperitoneal lymph node dissection) and bladder neck surgery [32]. Management would include a simple noninvasive technique of attempting to harvest the sperm from the postcoital urine from a fertility viewpoint [33], but from sexual dysfunction perspective the aim of treatment would be to help the patient achieve an antegrade

ejaculation. Use of a mechanical penile vibrostimulation (PVS), either single PVS or dual PVS, can be tried for these patients [34, 35]. While a choice of devices are commercially available, it would be prudent to use a device that offers an amplitude of vibration rated at 2.5 mm; these devices are also called high-amplitude vibrators. Sperm collection and success of antegrade ejaculation are best with these devices. The lower amplitude vibrators commercially available in the market are called "massagers" and offer an amplitude that is much lesser than 2.5 mm [36]. Where PVS fails, the use of electroejaculation (EEJ) with the help of an electroejaculator can be tried; when EEJ also fails and where fertility becomes the primary objective sperm retrieval from the testis is recommended [37].

**Conclusion**

Sexual dysfunction in an infertility setting represents a complex problem. "Infertility is a race against time." The very diagnosis of a male factor infertility and/or female factor infertility causes a loss of self-esteem, distress, and marital conflicts, all of which could potentially affect sexual function in either one or both of the partners. Patients presenting to an infertility clinic with both infertility and concomitant sexual dysfunction require specialized care and/or treatment using a multidisciplinary team-based approach. The most important point is that the couple must be advised and counseled to view the odyssey towards a normal sexual function and the quest for fertility as two separate and distinct issues.

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