Diagnostic evaluation of sexual dysfunction in the male partner in the setting of infertility: a committee opinion

Practice Committee of the American Society for Reproductive Medicine in Collaboration with the Society for Male Reproduction and Urology

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It is the responsibility of the clinician to assess for the presence of erectile dysfunction, ejaculatory dysfunction, or diminished libido in men presenting for evaluation of infertility. Referral to a reproductive urologist or other appropriate specialist with the requisite expertise in the evaluation and treatment of such conditions, including appropriate treatment of testosterone deficiency, is often warranted. This article replaces the article of the same name, last published in 2018. (Fertil Steril® 2023;120:967–72. ©2023 by American Society for Reproductive Medicine.)

El resumen está disponible en Español al final del artículo.

Key Words: Ejaculatory dysfunction, erectile dysfunction, assisted reproduction, libido, psychological impotence

S exual dysfunction is a common condition among men of reproductive age. It can significantly worsen because of the stress of conception efforts or a diagnosis of infertility. It is important to elicit this sensitive information and provide the appropriate referral. This document presents the diagnostic evaluation and treatment of the most common sexual dysfunction issues seen by fertility providers. These issues drive patients to seek care and offer healthcare providers an opportunity to improve male health.

ERECTILE DYSFUNCTION Detection

Male sexual dysfunction in the setting of infertility often presents with erectile dysfunction (ED). Erectile dysfunction is defined as the consistent inability to attain or maintain a penile erection of sufficient quality to permit satisfactory sexual intercourse (1). Erectile dysfunc-

tion is prevalent and increases with age. Severe and moderate-severity ED occur in 5% and 17%, respectively, of men aged 40-49 years. More than 152 million men worldwide were reported to have ED in 1995, and this number is projected to increase to 322 million in 2025 (2). It is present in 18%-89% of men with infertility (3–6). The prevalence of ED in infertile men is significantly higher than in fertile controls (6). Having an erection is a necessary component of unassisted conception and, often, of intrauterine insemination (IUI) or in vitro fertilization (IVF).

Erectile dysfunction may be indicative of serious health comorbidities. Men with ED without a history of cardiovascular disease have a 45% increased risk of having a subsequent cardiovascular event within 5 years compared with those without ED (7, 8). Erectile dysfunction is associated with a number

Fertility and Sterility® Vol. 120, No. 5, November 2023 0015-0282/\$36.00 Copyright ©2023 American Society for Reproductive Medicine, Published by Elsevier Inc. https://doi.org/10.1016/j.fertnstert.2023.07.001 of other treatable underlying factors or conditions, including smoking, diabetes, depression, hypertension, and heart disease (9, 10). Thus, it is important to inquire about multiple issues that affect a man's general health in men of all ages who present with ED, regardless of fertility status.

In the setting of infertility, ED can present in two main forms: psychogenic and organic. Psychogenic ED occurs when a man has normal penile blood flow and nerve function and may achieve an erection under some circumstances but, typically, not with his partner when trying to conceive. Typically, any form of situational ED, particularly that which presents or worsens after a couple begins trying to conceive, is psychogenic. Organic ED is commonly a result of diminished penile blood flow or nerve dysfunction and results in the inability to achieve or maintain an erection regardless of the situation (11). It is often associated with cardiovascular disease and, more commonly, presents in older men. Regardless of the origin, ED can have deleterious effects on psychosocial and relationship issues (12). The severity of ED may be initially

Received July 3, 2023; accepted July 5, 2023; published online October 3, 2023.

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determined through a careful history or a validated questionnaire, such as the International Index of Erectile Function (IIEF) or the Sexual Health Inventory for Men (13, 14).

A comprehensive history with a focus on risk factors for cardiovascular disease is a critical component of the ED evaluation. Specifically, the man should be queried about whether he obtains regular primary care; has any comorbidity such as diabetes, hypertension, coronary artery disease, or other cardiac conditions; reports a history of penile, prostate, or spine surgery; uses cigarettes, tobacco, or other recreational drugs; or has a family history of cardiovascular disease. Medication use such as beta blockers, hydrochlorothiazide, other antihypertensives, exogenous testosterone use, use of phosphodiesterase type-5 inhibitors (PDE5i) (such as sildenafil, tadalafil, avanafil, or vardenafil), or use of penile injection therapy should also be documented (15). Evaluation of psychogenic ED involves a thorough sexual history eliciting the onset and exact nature of the problem, with emphasis on whether the man has morning erections, ED with self-stimulation, a history of ED with prior partners, and the timing of the onset of the disease (11). A physical examination should include blood pressure and the calculation of body mass index, as well as an assessment for signs of testosterone deficiency. Morning serum testosterone should be assayed, as should glucose and hemoglobin A1c levels, as well as lipid profile measurements, as indicated (16).

Treatment

The cornerstone of ED treatment for either psychogenic or organic ED is reassurance to the patient that, in most cases, ultimately, the problem can be resolved. Further, it should be made clear to both the patient and his partner that a man's ED is not a function of his attraction or devotion to his partner. Referral to a mental health professional can be considered, as needed. For psychogenic ED, a trial of PDE5i may help restore a man's confidence and improve his chances of maintaining an erection (17). In cases of organic ED, the identification of comorbid conditions such as diabetes can be lifesaving. Lifestyle modification, including weight optimization, a healthy diet, and moderate exercise, may improve erectile function (18). In all cases, these men should have adequate follow-up with a primary care physician. The shared decision-making model can be used to begin a care pathway starting with lifestyle modification, substituting alternative medications in place of those that can exacerbate ED, and a trial of PDE5i in patients who have organic causes of ED such as spinal cord injuries (SCIs), radical pelvic surgery, severe atherosclerosis, or those who fail lifestyle therapy or desire rapid improvement in their ED.

Typically, these men may be started on a PDE5i trial with appropriate counseling about the risk of priapism (defined as an erection lasting >4 hours). Contraindications for PDE5i use include the use of nitrates and inadequate cardiac reserve for sexual activity, requiring clearance by a cardiologist. Further, these medications should be used with caution in men on an alpha blocker, as they can cause an unsafe drop in blood pressure. Side effects of PDE5i agents include headaches, facial flushing, muscle aches, nasal congestion, a blue tinge in vision, dizziness, dyspepsia, and priapism. Typical doses of PDE5i are sildenafil 50–100 mg, tadalafil 5–20 mg, vardenafil 10–20 mg, and avanafil 50–200 mg. When PDE5i therapy is not effective, patients can be transitioned to intracavernosal injection therapy under the care of a urologist (11). Should this fail, surgery to place a penile prosthesis may be indicated.

Patients with SCIs represent a unique population of men with ED. With normal physiologic function, the S2-4 nerve roots cause vasodilation of vessels in the corpora cavernosa, enabling erections. In general, a complete upper-motor neuron injury above T11 can result in reflex erections in the absence of psychogenic erections, although men with an injury impacting the sacral pathways have psychogenic erections but no reflex erections. Phosphodiesterase type-5 inhibitor therapy is the first-line treatment for men with SCI. Another option for ED treatment in men with SCI is intracavernosal injections, which should be started at a lower dose than for men with vasculogenic impotence; these men should be monitored for autonomic dysreflexia.

The evaluation and treatment of psychogenic ED, because it is more likely to present in infertile men, bears particular relevance to reproductive medicine specialists. Certainly, a reported history of diabetes mellitus and a prior history of prostate or penile surgery may obviate the need for any further testing because these conditions are reliably associated with organic ED (19). For less clear-cut circumstances, objective endpoints to discriminate between psychogenic and organic ED include nocturnal penile tumescence testing or penile duplex Doppler ultrasonography (19, 20). Questionnaires, including the frequently employed IIEF, may not always successfully differentiate between psychogenic and organic causes (20, 21). Indeed, in two studies each with 36 and 44 patients, 20%-37% of patients who scored severe ED on the basis of IIEF were found to have normal penile ultrasound dynamics, underscoring the necessity of further testing to differentiate between organic and psychogenic ED (20, 22). In patients with psychogenic ED, empirical psychotherapy with or without PDE5i therapy under the supervision of an appropriate specialist with the requisite expertise should be offered. The importance of an accurate diagnosis is underscored by the finding that up to 32% of 285 men with psychogenic ED in one study experienced resolution of symptoms immediately after a definitive diagnosis (23). This problem is particularly relevant among men who are unable to provide an ejaculated specimen on the day of oocyte retrieval. Therefore, early identification and treatment of this condition are of paramount importance. Additionally, patients with ED (or ejaculatory dysfunction) may warrant counseling and information about sperm banking before treatment in the event they cannot produce a semen sample on the day of planned fertility treatments.

PSYCHOLOGICAL STRESS

The effects of infertility-related stress are not as well studied in the male partner as they are in the female (24). A longitudinal study of infertility-related stress found that women experienced greater anxiety symptoms than men. Importantly, high levels of sexual infertility stress, defined as loss of enjoyment of sexual relations, feelings of pressure to schedule sexual relations, and loss of sexual self-esteem, were noted among 21% of the 295 men studied (25). Increased sexual dissatisfaction in both partners after IVF failure highlights the need to approach the complaint of ED holistically and consider referral to a specialized mental health professional for appropriate counseling (26). Interestingly, longterm follow-up of patients treated with assisted reproductive therapy found similar sexual satisfaction regardless of whether they were able to conceive a child (27).

EJACULATORY DYSFUNCTION

Ejaculatory dysfunction may have a substantial impact on fertility potential. Aspermia is the absence of antegrade ejaculation with orgasm. This may be because of the lack of seminal emission or because of retrograde ejaculation, which is the backward flow of the ejaculate into the bladder instead of antegrade expulsion out of the urethral meatus. In both circumstances, men will have a "dry orgasm" (28). Patients who undergo a retroperitoneal lymph node dissection for testicular cancer may have a loss of emission because of damage to the hypogastric plexus. For this reason, it is important to counsel these men about sperm banking before surgery when they desire future fertility. There is no available treatment for restoring seminal emission in these patients. In addition, men with ejaculatory duct obstruction may have absent or significantly reduced seminal emission; these patients may benefit from transurethral resection of the ejaculatory ducts to relieve the obstruction. Additional etiologies for lack of seminal emission can include SCI, radical prostatectomy, pelvic trauma, diabetes mellitus, multiple sclerosis, and Parkinson's disease. Testicular sperm extraction may be considered in those patients with failure of emission.

Retrograde ejaculation can be secondary to medications inhibiting bladder neck closure (i.e., alpha blockers) or because of surgical procedures on the prostate and/or bladder neck. Other etiologies include various neuropathies affecting bladder neck closure, which can be secondary to diabetes mellitus, SCI, neurologic disorders, or retroperitoneal lymph node dissection (29). When retrograde ejaculation is caused by an alpha blocker, stopping the medication will restore antegrade ejaculation. Otherwise, medical therapies aimed at treating retrograde ejaculation include alpha agonists and tricyclic antidepressants such as imipramine, which have been used with variable results (30, 31). When medical therapies are not successful or are not attempted, sperm can be collected from men with retrograde ejaculation using postejaculatory urine specimens and used for either IUI or IVF. Conventional protocols include urine alkalinization for a period of 24 hours, followed by a postorgasm urinalysis. This is essential for ensuring sperm viability so that it can be effectively used for IUI or IVF, depending on the amount and quality of sperm recovered.

Men with SCIs may present with aspermia secondary to either the absence of seminal emission or retrograde ejaculation. Many of these men also have anorgasmia, which is the inability to achieve an orgasm. There has been encouraging success with the use of penile vibratory stimulation to enable these patients to reach climax and produce an ejaculate (32). This is a minimally invasive method to potentially harvest sperm for either IUI or IVF. When there is no ejaculation, then the postejaculatory urine can be analyzed to assess retrograde ejaculation (29). When this is ineffective and an ejaculation is desired for fertility purposes, there have been promising results also with the use of electroejaculation in these patients (33).

Premature ejaculation (PE) refers to the triad of short ejaculatory latency, a lack of control over the ability to delay ejaculation, and personal distress as a result of this condition. Although the definition of PE is still evolving, "lifelong PE" is characterized by ejaculation that occurs within 1 minute of vaginal penetration (34). In patients with "acquired PE," this latency time may be up to 3 minutes (34). Certainly, there are imperfections with this strict definition in that it does not take into account homosexual relationships or early ejaculations before vaginal penetration. However, using this definition, the prevalence of PE has been estimated to be between 5% and 20% (35). Organic causes of PE have been identified because of penile hypersensitivity and 5-hydroxytryptamine receptor hypersensitivity; however, psychogenic influences such as anxiety, depression, and stress may further exacerbate PE. There are several over-the-counter lidocaine-based topical agents aimed at treating penile hypersensitivity (36). These are readily available to all men and are used commonly to delay ejaculation, even without a formal diagnosis of PE. Additionally, selective serotonin reuptake inhibitors have been successful in treating PE by activating the 5-hydroxytryptamine 2C receptor and, consequently, readjusting the ejaculatory threshold set point (37). It is important to emphasize also the role of sexual therapy, employing cognitive and behavioral techniques, as part of the treatment algorithm for PE. Involving the partner in the treatment process and encouraging open communication about sexuality may yield greater relationship benefits as well.

DECREASED LIBIDO

Hormonal dysfunction is frequently associated with sexual complaints among infertile men, most commonly related to diminished libido. Evaluation of these symptoms may include straightforward questions during the medical interview or employing a validated questionnaire, such as the androgen deficiency in aging male's test (38). Indeed, 43% of 94 men presenting to an infertility clinic with normozoospermia provided a positive response to a validated questionnaire of symptoms consistent with testosterone deficiency (37). Men presenting with oligozoospermia have concomitant hypoandrogenism in 42%-50% of cases (37). Correction of testosterone deficiency in the setting of ED should be approached with modest expectations (39, 40). However, men with complaints related specifically to diminished libido in the setting of testosterone deficiency may achieve good symptomatic benefit from hormonal therapy (41).

Exogenous testosterone replacement therapy should be avoided in men attempting conception because of disruption of normal spermatogenesis. Exogenous testosterone leads to iatrogenic suppression of hypothalamic gonadotropin-releasing hormone secretion, with resultant decreases in pituitary gonadotropin secretion. In turn, this results in decreased intratesticular testosterone concentrations and reduced spermatogenesis, often to the point of azoospermia. Higher doses of testosterone are more likely to suppress the hypothalamic-pituitary-testis axis (42). Alternative therapies for testosterone optimization in men with symptomatic testosterone deficiency who are attempting to conceive include selective estrogen receptor modulators, aromatase inhibitors, and human chorionic gonadotropin (41).

CONCLUSION

- Psychological distress from infertility contributes to male sexual dysfunction.
- Studies show that significant, but treatable, medical comorbidities may be identified during evaluation.
- Aspermia caused by retrograde ejaculation may be treated medically, or sperm can be collected from postejaculatory urine samples.
- Aspermia caused by failure of emission can be circumvented by a testicular sperm extraction attempt.
- Exogenous testosterone has the potential to suppress spermatogenesis.
- Erectile dysfunction is a common, correctable problem that may occur in infertile men.
- Evaluation and treatment of male sexual dysfunction serve as an opportunity to improve a man's somatic health.
- For men with symptomatic testosterone deficiency who are attempting to conceive, exogenous testosterone use should be avoided.

Acknowledgments: This report was developed under the direction of the Practice Committee of the American Society for Reproductive Medicine as a service to its members and other practicing clinicians. Although this document reflects appropriate management of a problem encountered in the practice of reproductive medicine, it is not intended to be the only approved standard of practice or to dictate an exclusive course of treatment. Other plans of management may be appropriate, taking into account the needs of the individual patient, available resources, and institutional or clinical practice limitations. The Practice Committee and the Board of Directors of the American Society for Reproductive Medicine have approved this report.

This document was reviewed by ASRM members and their input was considered in the preparation of the final document. The following members of the ASRM Practice Committee participated in the development of this document: Clarisa Gracia, M.D., M.S.C.E.; Alan Penzias, M.D.; Jacob Anderson; Paula Amato, M.D.; Kristin Bendikson, M.D.; Clarisa Gracia, M.D., M.S.C.E.; Tommaso Falcone, M.D.; Rebecca Flyckt, M.D.; Karl Hansen, M.D., Ph.D.; Micah Hill, D.O.; Sangita Jindal, Ph.D.; Suleena Kalra, M.D., M.S.C.E.; Tarun Jain, M.D.; Bruce Pier, M.D.; Michael Thomas, M.D.; Richard Reindollar, M.D.; Jared Robins, M.D.; Chevis N Shannon, Dr.Ph., M.B.A., M.P.H.; Anne Steiner, M.D., M.P.H.; Cigdem Tanrikut, M.D.; and Belinda Yauger, M.D. The Practice Committee acknowledges the special contribution of Cigdem Tanrikut, M.D. in the preparation of this document. All committee members disclosed commercial and financial relationships with manufacturers or distributors of goods or services used to treat patients. Members of the committee who were found to have conflicts of interest on the basis of the relationships disclosed did not participate in the discussion or development of this document.

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Evaluación diagnóstica de la disfunción sexual en la pareja masculina en el contexto de la infertilidad: opinión del comité

Es responsabilidad del médico evaluar la presencia de disfunción eréctil, disfunción eyaculatoria o disminución de la libido en hombres que se presentan para la evaluación de infertilidad. A menudo se justifica la derivación a un urólogo reproductivo u otro especialista apropiado con la experiencia necesaria en la evaluación y el tratamiento de estas condiciones, incluido el tratamiento adecuado de la deficiencia de testosterona. Este artículo reemplaza el artículo del mismo nombre, publicado por última vez en 2018.