Sexual Desire Disorders

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ABSTRACT

Hypoactive sexual desire disorder (HSDD) and sexual aversion disorder (SAD) are an under-diagnosed group of disorders that affect men and women. Despite their prevalence, these two disorders are often not addressed by healthcare providers and patients due their private and awkward nature. As physicians, we need to move beyond our own unease in order to adequately address our patients' sexual problems and implement appropriate treatment. Using the Sexual Response Cycle as the model of the physiological changes of humans during sexual stimulation and the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* this article will review the current literature on the desire disorders focusing on prevalence, etiology, and treatment.

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INTRODUCTION

Hypoactive sexual desire disorder (HSDD) and sexual aversion disorder (SAD) affect both men and women. Despite their prevalence, these disorders are often not addressed by healthcare providers or patients due to their private and awkward nature. Using the Sexual Response Cycle as the model of the physiological changes of humans during sexual stimulation and the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV-TR), this article will review the current literature on the two desire disorders, focusing on prevalence, etiology, and treatment. With this knowledge, hopefully, physicians will move beyond their unease with the topic in order to adequately address patients' sexual problems and to implement appropriate treatment.

Sexuality defined. Sexuality is a complex interplay of multiple facets, including anatomical, physiological, psychological, developmental, cultural, and relational factors.[1] All of these contribute to an individual's sexuality in varying degrees at any point in time as well as developing and changing throughout the life cycle. Sexuality in adults consists of seven components:

- Gender identity
- Orientation
- Intention

- Desire
- Arousal
- Orgasm
- Emotional satisfaction

Gender identity, orientation, and intention form sexual identity, whereas desire, arousal, and orgasm are components of sexual function. The interplay of the first six components contributes to the emotional satisfaction of the experience. In addition to the multiple factors involved in sexuality, there is the added complexity of the corresponding sexuality of the partner. The expression of a person's sexuality is intimately related to his or her partner's sexuality.[2,3]

Sexual response cycle. The sexual response cycle consists of four phases: desire, arousal, orgasm, and resolution. Phase 1 of the sexual response cycle, desire, consists of three components: sexual drive, sexual motivation, and sexual wish. These reflect the biological, psychological, and social aspects of desire, respectively. Sexual drive is produced through psychoneuroendocrine mechanisms. The limbic system and the preoptic area of the anterior-medial hypothalamus are believed to play a role in sexual drive. Drive is also highly influenced by hormones, medications (e.g., decreased by antihypertensive drugs, increased by dopaminergic compounds to treat Parkinson's disease), and legal and illegal substances (e.g., alcohol, cocaine).[4]

Phase 2, arousal, is brought on by psychological and/or physiological stimulation. Multiple physiologic changes occur in men and women that prepare them for orgasm, mainly perpetuated by vasocongestion. In men, increased blood flow causes erection, penile color changes, and testicular elevation. Vasocongestion in women leads to vaginal lubrication, clitoral tumescence, and labial color changes. In general, heart rate, blood pressure, and respiratory rate as well as myotonia of many muscle groups increase during this phase.[5]

Phase 3, orgasm, has continued elevation of respiratory rate, heart rate, and blood pressure and the voluntary and involuntary contraction of many muscle groups. In men, ejaculation is perpetuated by the contraction of the urethra, vas, seminal vesicles, and prostate. In women, the uterus and lower third of the vagina contract involuntarily.

The duration of the final phase, resolution, is highly dependent on whether orgasm was achieved. If orgasm is not achieved, irritability and discomfort can result, potentially lasting for several hours. If orgasm is achieved, resolution may last 10 to 15 minutes with a sense of calm and relaxation. Respiratory rate, heart rate, and blood pressure return to baseline and vasocongestion diminishes. Women can have multiple successive orgasms secondary to a lack of a refractory period.[1] The vast majority of men have a refractory period following orgasm in which subsequent orgasm is not possible.[6]

CRITERIA

As previously stated, there are two sexual desire disorders. HSDD in the DSM-IV-TR[7] is defined as "persistently or recurrently deficient (or absent) sexual fantasies and desire for sexual activity. The judgment of deficiency or absence is made by the clinician, taking into account factors that affect sexual functioning, such as age and the context of the person's life." SAD is defined as "persistent or recurrent extreme aversion to, and avoidance of, all (or almost all) genital sexual contact with a sexual partner." The DSM-IV-TR lists six subtypes: lifelong, acquired, generalized, situational, due to psychological factors, and due to combined factors.[7] In order for a patient to be diagnosed with a sexual dysfunction disorder, a psychophysiologic problem must exist, the problem must cause marked distress or interpersonal difficulty, and the problem cannot be better accounted for by another Axis I diagnoses. Also, two sexual disorders must be ruled out before one can diagnosis HSDD or SAD. These are substance-induced sexual dysfunction and a sexual disorder due to general medical condition.

PREVALENCE

The prevalence of desire disorders is often underappreciated. The National Health and Social Life Survey found that 32 percent of women and 15 percent of men lacked sexual interest for several months within the last year. The study population was noninstitutionalized US English speaking men and women between the ages of 18 and 59 years.[8] There are no large study prevalence figures on SAD, but it is thought to be a rare disorder. Both HSDD and SAD have a higher female to male prevalence ratio, although this discrepancy is greater in SAD. The desire disorders can be considered on a continuum of severity with HSDD being the less severe of the two disorders.[1]

Despite their prevalence, these disorders are often not addressed by healthcare providers or patients due to their private and awkward nature. Physicians must move beyond their unease in order to adequately address patients' sexual problems and implement appropriate treatment.

ETIOLOGY

The proposed etiology of HSDD influences how it is subtyped (i.e., generalized or situational, lifelong or acquired). For example, lifelong HSDD can be due to sexual identity issues (gender identity, orientation, or paraphilia) or stagnation in sexual growth (overly conservative background, developmental abnormalities, or abuse). Conversely,

TABLE 1. Common psychotropic classes causing sexual dysfunction

TRICYCLIC ANTIDEPRESSANTS
Mechanism of action (general)
• Inhibits the re-uptake of norepinephrine and serotonin (5-HT) • Modulates norephinephrine and 5-HT activity at the neural synapse
Mechanism of action (sexual)
Positive Increased adrenergic α_1 activity Decreased cortisol Negative Decreased β–adrenergic activity Decreased cholinergic activity Decreased histamine Decreased oxytocin Increased prolactin Increased serotonin
*Direct sexual side effects**
Desire disorders Dyspareunia Erection difficulties Orgasm disorders Orgasmic inhibition Anorgasmia Spontaneous orgasm Ejaculation disorders Retarded ejaculation Ejaculation without orgasm Anesthetic ejaculation * Despiramine appears to have the least amount of sexual side effects of the TCAs
MONOAMINE OXIDASE INHIBITORS
Mechanism of action (general)
• Decreases the neural monoamine oxidase enzymatic metabolic breakdown of norepinephrine and serotonin I • Increases norepinephrine and serotonin activity at the neural synapse
Mechanism of action (sexual)
Positive Increased adrenergic α_1 activity Decreased monoamine oxidase Negative Decreased β-adrenergic activity Decreased cholinergic activity Increased prolactin Increased serotonin Decreased testosterone
*Direct sexual side effects**
Desire disorders Erection difficulties Orgasm disorders Orgasmic inhibition Decreased number Ejaculation disorders Retarded, inhibited premature ejaculation diminished

Adapted from Crenshaw TL, Goldberg JP. *Sexual Pharmacology: Drugs That Affect Sexual Functioning.* New York, NY: W. W. Norton & Company, 1996.

difficulty in a new sexual relationship may lead to an acquired or situational subtype of HSDD. Although it is theoretically possible to have no etiology, all appropriate avenues should be explored, including whether the patient was truthful in responses to questions regarding sexuality and if the patient is consciously aware that he or she has a sexual disorder.[2,3]

Diagnosis and treatment of desire disorders is often difficult due to confounding factors, such as high rates of comorbid disorders and combined subtype sexual disorders involving medical and substance-induced contributors.[13] For example, in a patient being treated for recurrent major depressive disorder and obstructive sleep apnea (OSA), it would be difficult to separate out whether the cause of his or her decreased sexual desire was due to the depressive episode, antidepressant treatment, OSA,[15] multiple potential interpersonal problems, or a combination of factors.

Even with a detailed and accurate longitudinal history, honing in on the main factor can be difficult. Decreased sexual desire has been seen in multiple psychiatric disorders. For example, individuals with schizophrenia and major depression experienced decreased sexual desire. Before treatment commences for HSDD and SAD, a thorough work-up must be done to first rule out a general medical condition or a substance that caused decreased desire or aversion. This would include a thorough physical exam and laboratory work-up. An important physiological maker for which to test is a thyroid profile, which would be abnormal in hypothyroidism and could cause decreased sexual desire.[16] Also, low testosterone has been shown affect to desire. Normal physiological testosterone concentrations range from 3 to 12ng/mL. The apparent critical level for sexual function in males is 3ng/mL.[14]

A variety of medical conditions can also decrease sexual desire (e.g., diabetes mellitus, hypothyroidism, Addison's disease, Cushing's disease, temporal lobe lesions, menopause,[16] coronary artery disease, heart failure, renal failure, stroke, and HIV). Also, as we naturally age, desire can lessen.[14] Many psychiatric medications can lead to decreased desire for sex including multiple classes of antidepressants (selective serotonin reuptake inhibitors, norepinephrine serotonin reuptake inhibitors, tricyclic antidepressants, monoamine oxidase inhibitors, and antipsychotics (Table 1).[22]

Two important biological mediators of sexual desire are dopamine and prolactin. Dopamine acting through the mesolimbic dopaminergic reward pathway is hypothesized to increase desire, whereas prolactin is thought to decrease libido, although the mechanisms are poorly understood. Dopamine directly inhibits prolactin release from the pituitary gland. Medications that increase prolactin release or inhibit dopamine release can decrease sexual desire along with other sexual side effects.[19]

If a patient has no history of sexual desire problems and has started a new sexual relationship, other possibilities for low sexual desire must be excluded. It is possible that neither individual has a desire disorder but rather there is a marked difference between each individual's level of desire, creating a discrepancy. Separate interviews with each partner are important to obtain a more accurate picture of the relationship.[13]

Important to remember that HSDD in men is often misdiagnosed as erectile dysfunction because of the common misconception that all men desire sex. This myth has caused men to not seek treatment and has also led to misdiagnosis by health professionals. This may partly explain the failure rate of adequately treating erectile dysfunction. As part of an initial history and physical examination, a sexual history is necessary because most patients will not divulge any sexual problems unless explicitly asked. There are

tests that deal entirely with sexual desire (Sexual Desire Inventory) and others have subscales for sexual desire (International Index of Erectile Function).[14]

TREATMENT

Psychotherapy. Although there are many proposed treatments for desire disorders, there are virtually no controlled studies evaluating them.[20] Psychotherapy is a common treatment for desire disorders. From a psychodynamic perspective, sexual dysfunction is caused by unresolved unconscious conflicts of early development. Treatment focuses on bringing awareness to these unresolved conflicts and how they impact the patient's life. While improvement may occur, the sexual dysfunction often becomes autonomous and persists, requiring additional techniques to be employed.

An approach that has shown some success in the treatment of desire disorders as well as other sexual dysfunctions, pioneered by Masters and Johnson, is dual sex therapy.[5] In this therapy, the couple along with one male and one female therapist (gay and lesbian couples may opt for same-sex therapists) meet together. The relationship is treated as a whole, with sexual dysfunction being one aspect of the relationship. Another important underlying premise of this form of therapy is that only one partner in the relationship is suffering from sexual dysfunction and absence of other major psychopathology. The aim is to reestablish open communication in the relationship. Homework assignments are given to the couple, the results of which are discussed at the following session. The couple is not allowed to engage in any sexual behavior together other than what is assigned by the therapists. Assignments start with foreplay, which encourages the couple to pay closer attention to the entire process of the sexual response cycle as well as the emotions involved and not solely on achieving orgasm. Eventually the couple progresses to intercourse with encouragement to try various positions without completing the act.[1]

Cognitive behavioral therapy has been shown to be efficacious in the treatment of anxiety, depression, and other psychiatric disorders. Its core premise is that activating events lead to negative automatic thoughts. These negative thoughts in turn result in disturbed negative feelings and dysfunctional behaviors. The goal is to reframe these irrational beliefs through structured sessions.[21] CBT has been also used to treat sexual desire disorders by focusing on dysfunctional thoughts, unrealistic expectations, partner behavior that decreases desire in intercourse, and insufficient physical stimulation. These sessions often include both partners.[20] Specific exercises may be used. For example, men with sexual desire disorder or male erectile disorder may be instructed to masturbate to address performance anxiety related to achieving a full erection and ejaculation.

Finally, analytically oriented sex therapy combines sex therapy with psychodynamic and psychoanalytic therapy and has shown good results.[1] Specifically, for desire disorders due to developmental and identity issues, long-term psychodynamic psychotherapy could be helpful.[9] In general, lifelong and generalized desire disorders are more difficult to treat.[13]

SAD is often progressive and rarely reverses spontaneously. It is also treatment-resistant.[2] Poor prognostic indicators are global, lifelong, comorbid depression, or associated with anorgasmia.[24] Despite difficulty in treatment, behavioral therapy has been shown to be effective for managing SAD.[25,26]

Pharmacotherapy. Multiple hormones have been studied for treatment of sexual desire disorders. For example, androgen replacement has been studied as a possible treatment for HSDD. "In patients with induced or spontaneous hypogonadism, either pathological withdrawal and re-introduction or

TABLE 1. Common psychotropic classes causing sexual dysfunction, continued

SELECTIVE SEROTONIN REUPTAKE INHIBITORS
Mechanism of action (general)
• Work through selective serotonin-uptake inhibition
Mechanism of action (sexual)
Negative Increased cortisol Increased opioids Increased prolactin Increased serotonin (5-HT)
Direct sexual side effects
Desire disorders Hyposexuality Hypersexuality Orgasm disorders Orgasmic inhibition Anorgasmia Spontaneous orgasm Ejaculation disorders Retarded ejaculation Ejaculatory inhibition Erection disorders Inability/difficulty obtaining erection Decreased quality of erection Decreased or absent nocturnal/morning erections
ANTIPSYCHOTICS
Mechanism of action (general)
• Block dopamine activity • Block sigma receptors and/or 5-HT2 serotonin receptors
Mechanism of action (sexual)
Negative Decreased adrenergic ·1 activity Decreased cholinergic activity Decreased dopamine Increased prolactin Decreased testosterone Decreased LHRH pulsatile activity
Direct sexual side effects
Desire disorders Hyposexuality Hypersexuality (rare) Orgasm disorders Orgasmic inhibition Anorgasmia Diminished number of orgasms Ejaculation disorders Retarded ejaculation Ejaculatory inhibition Decreased ejaculatory volume Anesthetic ejaculation Orgasm without ejaculation Dyspareunia Erection disorders Inability/difficulty obtaining erection Decreased quality of erection Priapism

Adapted from Crenshaw TL, Goldberg JP. *Sexual Pharmacology: Drugs That Affect Sexual Functioning.* New York, NY: W. W. Norton & Company, 1996.

exogenous androgens affects the frequency of sexual fantasies, arousal, desire, spontaneous erections during sleep and in the morning, ejaculation, sexual activities with and without a partner, and orgasms through coitus and masturbation."[14] Unfortunately, the evidence for the efficacy of testosterone in eugonadal men is conflicting. Some studies show no benefit,[27] whereas others studies do show some benefit. For example, a study by O'Carroll and Bancroft showed that testosterone injections did have efficacy for sexual interest, but unfortunately this did not translate into an improvement in their sexual relationships.[34] One theory for the lack of efficacy in eugonadal men is that it is more difficult to manipulate endogenous androgen levels with administration of exogenous androgens due to efficient homeostatic hormone mechanisms.[14] Androgen supplementation is available in many forms, including oral, sublingual, cream, and dermal patch. Side effects of testosterone supplementation in women include weight gain, clitoral enlargement, facial hair, hypercholesterolemia,[32] changes in long-term breast cancer risk, and cardiovascular factors.[16] Side effects in men of androgen supplementation include hypertension and prostatic enlargement.[1] The benefit of androgen therapy in women is also not clear.[28] Although studies using supraphysiologic levels of androgens have shown increased sex libido, there is the risk of masculinization from chronic use.[18] Testosterone therapy has shown to improve sexual function in postmenopausal women in multiple ways, including increased desire, fantasy, sexual acts, orgasm, pleasure, and satisfaction of sexual acts.[16] Roughly half of all testosterone production in women is from the ovaries. Thus, an oophorectomy can cause a sudden drop of testosterone levels.[18] Shifren, et al.,[17] studied 31- to 56-year-old women who had hysterectomies and oophorectomies. They were given 150 or 300µg of testosterone daily for 12 weeks. Both groups, with a dose response relationship, showed increased frequency of sexual activities and pleasurable orgasms. At the 300µg dose, there was even higher scores for frequency of fantasy, masturbation, and engaging in sexual intercourse at least once a week.[18] Feelings of general wellbeing were also increased.[17]

Estrogen replacement in postmenopausal women can improve clitoral and vaginal sensitivity, increase libido, and decrease vaginal dryness and pain during intercourse. Estrogen is available in several forms, including oral tablets, dermal patch, vaginal ring, and cream. Testosterone supplementation has demonstrated increased libido, increased vaginal and clitoral sensitivity, increased vaginal lubrication, and heightened sexual arousal.[32]

Dehydroepiandrosterone-sulfate (DHEA-S), a testosterone precursor, has also been studied for the treatment of sexual desire disorders. Low physiologic levels of DHEA-S have been found in women presenting with HSDD.[30] Increased libido was observed in women with adrenal insufficiency who were given DHEA-S.[31] Women with breast cancer reported increased libido while receiving tamoxifen, which increases gonadotropin-releasing hormone levels and therefore testosterone concentrations.[1]

Some medications can be used to increase desire due to their receptor profiles. For example, amphetamine and methylphenidate can increase sexual desire by increasing dopamine release. Bupropion, a norepinephrine and dopamine reuptake inhibitor, has been shown to increase libido.[19] A study by Segraves, et al.,[33] showed that bupropion treatment in premenopausal women increased desire, but not to a statistically significant level compared to placebo. But, bupropion SR group did show statistically significant difference in other measures of sexual function: increased pleasure and arousal, and frequency of orgasms. Multiple herbal remedies, such as yohimbine and ginseng root, are purported to increase desire, but this has not been confirmed in studies.[1]

CONCLUSION

Sexual desire disorders are under-recognized, under-treated disorders leading to a great deal of morbidity in relationships. A thorough history and physical examination are critical to properly diagnosis and determine the causative agent(s). With appropriate treatment, improvement can be made but continued research in sexual dysfunction is critical in the sensitive yet ubiquitous area. By becoming more familiar with prevalence, etiology, and treatment of sexual desire disorders, physicians hopefully will become more comfortable with the topic so that they can adequately address patients' sexual problems and to implement appropriate treatment.

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