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The impact of stress urinary incontinence on sexual activity in women

ABSTRACT

In women, stress urinary incontinence is a common problem that may lead to sexual dysfunction. We review the epidemiological data, the pathophysiology, and the risk factors for these two "closet" disorders, how they are related, how we can get patients to talk about them, and how the treatment of stress urinary incontinence may affect sexual dysfunction.

KEY POINTS

More than a third of adult women experience urinary incontinence, with stress urinary incontinence accounting for up to 50% of all cases.

A well-recognized risk factor for stress incontinence is vaginal childbirth: one third of women experience stress incontinence 5 years after their first vaginal delivery.

Leakage of urine during sexual activity is common in women with stress incontinence and may lead to sexual dysfunction.

Leakage appears to occur more frequently during penetration in women with stress urinary incontinence. Women with urge incontinence more often report leakage during orgasm.

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This paper discusses therapies that are experimental or are not approved by the US Food and Drug Administration for the use under discussion.

MORE THAN A THIRD of adult women experience urinary incontinence,[1] and pure stress urinary incontinence accounts for up to half of all cases.[1] While not a life-threatening disorder, the social[2,3] and economic[4] consequences of urinary incontinence may be profound. Nevertheless, it remains a "closet" problem, as an appreciable number of women do not seek treatment, even when their symptoms cause significant distress and interfere with daily activities.[2,5,6]

In some cases, wearing pads or modifying daily activities helps limit embarrassing situations.[2,3,7] When leakage occurs during sexual activity, however, the disorder may be more difficult to cope with, and the psychological impact[8] and the strain on a relationship[9] may be significant.

Defining what role stress urinary incontinence plays in sexual dysfunction is challenging, due in part to the complex etiology of sexual dysfunction and to the taboo nature of both disorders. The aim of this article is to review the epidemiologic data and discuss our current understanding of the relationship between these two disorders and the challenges faced in addressing this topic with patients.

WHAT IS STRESS URINARY INCONTINENCE, AND HOW COMMON IS IT?

Stress urinary incontinence is defined as the complaint of involuntary leakage of urine on effort or exertion, or on sneezing or coughing,[10] usually resulting from urethral or bladder neck hypermobility or urethral sphincter insufficiency. A diagnosis is provisionally based on the patient's history and signs of

TABLE 1

Potential risk factors for stress urinary incontinence

Age
Pregnancy
Vaginal childbirth
Obesity
Constipation
Smoking
Chronic respiratory disease
Use of alpha-blockers
Pelvic surgery

leakage during the stress test, and is confirmed through urodynamic evaluation.[10]

In contrast, urge incontinence is the complaint of involuntary leakage accompanied or immediately preceded by a feeling of urgency.[10] Urge incontinence usually results from overactivity of the detrusor muscle that may (in the case of motor urgency) or may not (in the case of sensory urgency) be confirmed during urodynamic testing.

1/3 of women have some stress urinary incontinence 5 years after their first vaginal birth

Prevalence increases with age

The true prevalence of stress urinary incontinence is open to conjecture, as it is for urinary incontinence in general, since sampling techniques, case definitions, and the questions asked of study participants differ dramatically between studies. Moreover, underreporting is to be expected, given the embarrassment associated with the problem. Yet the problem is more prevalent with increasing age. A recent summary[1] estimates the prevalence of urinary incontinence in general to be from 20% to 50%, with a broad peak during middle age (30% to 40%) and a steady increase in the elderly (30% to 50%).

Stress incontinence is more prevalent than other types

Pure stress incontinence accounts for half of all cases of urinary incontinence in women, but a component of stress incontinence is seen in three fourths of all cases of urinary incontinence.[1] A meta-analysis by Hampel et al[11] revealed similar findings: In data published from 1954 to 1995, 10% to 50% of women reported symptoms of urinary incontinence, with pure stress incontinence accounting for 49% of all incontinence cases, and a stress component evident in a further 29%.[11]

In a recent nationwide US survey of 24,581 community-dwelling women, 9,002 (37%) reported incontinence symptoms within the past 30 days.[12] Of these, 41% reported stress incontinence only, with a further 45% reporting symptoms of both stress and urge incontinence, thus totaling more than 85% of women with urinary incontinence with a stress component.

Risk factors for stress incontinence

In addition to age,[1] another well-recognized risk factor for stress incontinence is vaginal childbirth, with one third of women experiencing stress incontinence 5 years after their first delivery,[13] presumably due to neuromuscular damage to the urethral sphincter or pelvic floor, or to injury to the supporting connective tissue. Other risk factors have not been as vigorously studied, but may include obesity,[14,15] constipation,[14] smoking,[16] chronic obstructive lung disease,[17] use of alpha-blockers,[18] and pelvic surgery[19,20] (TABLE 1).

WHAT IS FEMALE SEXUAL DYSFUNCTION, AND HOW COMMON IS IT?

The definition of sexual dysfunction has evolved since the early 1990s as has our understanding of the normal cycle of female sexual response. This cycle, initially defined by Masters and Johnson,[21] was later divided by Kaplan[22] into three phases—desire, arousal, and orgasm. This forms the basis for the current definition of female sexual dysfunction, as proposed by American Foundation of Urologic Disease in 1998.[23] Using this classification, sexual dysfunction encompasses:

- Hypoactive sexual desire and sexual aversion disorders (deficiency of sexual thoughts or receptivity to sexual activity that causes personal distress)
- Sexual arousal disorder (inability to attain or maintain sufficient sexual excitement that causes personal distress)
- Orgasmic disorder
- Sexual pain disorders, which include dyspareunia (genital pain associated with sexual

intercourse) and vaginismus (involuntary spasm of the musculature of the outer third of the vagina interfering with penetration).

Note that the diagnosis requires that symptoms be severe enough to cause personal distress.[23]

Prevalence of sexual dysfunction

Establishing an estimate for the prevalence of sexual dysfunction in women in the general population is plagued with challenges similar to those for urinary incontinence. For example, the case definition is not standardized, and underreporting is surely to be expected, given social taboos associated with it. Ideally, evaluation of sexual dysfunction should encompass a physical examination, a psychological and psychosocial assessment, and, in some cases, an endocrine evaluation. To limit the embarrassment of answering sensitive questions on sexual activity openly, the assessment should use a questionnaire that can be filled out at home, since self-reporting tools have been shown to provide a more valid measurement of sexual function.[24,25]

By far the most commonly cited prevalence rate of sexual dysfunction in US women is 43%.[26] This finding was from a study in 2000 of 1,749 women ages 18 to 59 participating in the National Health and Social Life Survey. Importantly, sexual dysfunction in this case was not based on clinical diagnosis, but was defined only as a report of lack of interest in sex, inability to achieve orgasm, pain during sex, sex that was not pleasurable, anxiety about performance, or trouble lubricating. It is not clear how many of these women experienced personal distress, as required for diagnosis.[23]

Causes of sexual dysfunction

The etiology of female sexual dysfunction is complex and encompasses biological, psychological, and interpersonal factors[23] (TABLE 2). Biological factors may include reduced vascular flow to the genital tissues, or injury or disease of the central or peripheral nervous system. Psychological factors include lack of emotional intimacy[27] and depression.[28] In addition, drugs used to treat depression can also adversely affect sexual function.[29]

Other risk factors for sexual dysfunction in women include a history of traumatic sexual events,[26] diabetes,[30] hypertension,[31] pelvic inflammatory disease,[32] or pelvic trauma.[33] Menopause and the ensuing lowered estrogen levels may also result in sexual dysfunction,[21] for example, as a consequence of decreased lubrication. Conversely, the prevalence of sexual problems, except for inadequate lubrication, generally decreases with age.[26]

TABLE 2

Factors associated with female sexual dysfunction

- Urinary incontinence
- Age
- Lack of emotional intimacy
- Depression
- Antidepressant drugs
- History of a traumatic sexual event
- Diabetes
- Hypertension
- Pelvic inflammatory disease
- Pelvic trauma
- Menopause

DOES LEAKAGE OCCUR DURING SEXUAL ACTIVITY?

A diagnosis of sexual dysfunction requires that symptoms cause personal distress

Studies suggest urinary leakage occurs during sexual activity in 11% to 60% of women with stress urinary incontinence.[3,8,34–45] This large range likely reflects methodological and population differences between studies and small sample sizes.

Study populations have consisted primarily of women attending clinics specifically focusing on urologic concerns, although studies of general populations have also been conducted. In a study by Lam et al,[3] a self-administered questionnaire was mailed to a random sample of women living in Aarhus, Denmark. Overall, 12% of 441 women with stress urinary incontinence reported leakage during sexual intercourse. Nygaard and Milburn[46] provided mail-in questionnaires to all nonpregnant women presenting for routine annual gynecologic examination in selected clinics in Iowa over a 1-month period. Of the 224 who returned the questionnaire, 77% reported urinary leakage to some degree ("mild" or

TABLE 3

Measures of the impact of urinary incontinence on quality of life and sexual function in women

Generic measures of quality of life
- Medical Outcomes Study Short Form (SF-36)[50]
- EuroQol/EQ-5D[51]
- Sickness Impact Profile (SIP)[52]
- Nottingham Health Profile Questionnaire[53]

Measures of quality of life specific to urinary incontinence
- Urogenital Distress Inventory (UDI)[54]
- Bristol Female Lower Urinary Tract Symptoms Questionnaire (B-FLUTS)[55]
- Urinary Incontinence Quality of Life Instrument (I-Qol)[56]
- Incontinence Impact Questionnaire (IIQ)[57]
- Kings Health Questionnaire[58]

Measures of quality of life specific to sexual function
- Golombok-Rust Inventory of sexual satisfaction[60]
- Psychosocial Adjustment to Illness Scale (PAIS)[61]
- Brief Index of Sexual Functioning for Women (BISF-W)[62]
- Female Sexual Function Index (FSFI)[63]
- Derogatis Interview for Sexual Functioning (DISF/DISF-SR)[64]
- Simple Sexual Function Questionnaire[65]

Measures of sexual function specific to urinary incontinence
- B-FLUTS (Sex) Questionnaire[55]
- I-Qol[56]
- IIQ[57]
- Kings Health Questionnaire[58]
- Pelvic Organ Prolapse/Urinary Incontinence Sexual Function Questionnaire (PISQ)[49]
- PISQ Short Form (PISQ-12)[59]

The etiology of female sexual dysfunction is complex

"moderate"), with 12% of those with mild incontinence and 24% of those with moderate incontinence reporting urine loss during sexual activity. In this study, stress urinary incontinence was not specifically discussed, although four of the seven nonsexual questions focused on urinary incontinence with physical exertion. Interestingly, in this study 2 (4%) of the 52 women who did not report incontinent episodes based on the nonsexual questioning did report incontinence during sexual activity.

AT WHAT STAGE OF SEXUAL ACTIVITY DOES LEAKAGE OCCUR?

Several survey studies have included questions designed to determine at what point during sexual activity leakage is likely to occur. In a case-control study by Hilton,[36] 48 (23%) of the women with stress incontinence experienced incontinence during intercourse. Of these women, 18% reported incontinence during penetration and 5% during orgasm. These results are supported by those of Clark and Romm,[38] who concluded that leakage was more likely to occur during penetration than during arousal, orgasm, or resolution. In a later study of 57 incontinent women who reported leakage during sexual activity, 14 were diagnosed with pure stress incontinence through questioning, and 12 (86%) of these reported urine loss during deep penetration.[40] Urine leakage during other sexual activities was not described in this study. Berglund and Fugl-Meyer[41] found that of 44 women with stress urinary incontinence who were referred for surgery, 12 (27%) had reported leakage related to the penetration movements during intercourse (prior to surgery), and a further 13 (30%) were unsure if they had experienced leakage during intercourse. While 39% of these 44 women reported orgasmic dysfunc-

tion, leakage as a direct cause of orgasmic dysfunction (that is, fear of leakage that led to distraction) was volunteered by only 2 women. In another study,[46] women undergoing a routine gynecologic examination reported that leakage was more common during orgasm than penetration, although numbers reporting these specific concerns were small (6 vs 2 women) and the diagnosis of urinary incontinence was not specific to stress incontinence.[46]

Based on the limited data, leakage appears to occur more frequently during penetration in women with stress urinary incontinence,[36,38] but women with urge incontinence more often report leakage during orgasm.[36,38]

WHAT IS THE IMPACT OF LEAKAGE ON SEXUAL ACTIVITY?

One can readily appreciate that a woman who has experienced urinary leakage during sexual activity is likely to be apprehensive of similar episodes in the future. In fact, while urinary leakage during sexual activity generates immediate embarrassment, the long-term psychological impact is likely to be of greater significance.[8] Women with stress incontinence report a number of factors that contribute to a decreased interest in sexual activity: loss of spontaneity, the need for washing or for disposal of wet pads, the need for separate beds, a general feeling of unattractiveness from wearing pads in bed, and concerns over odor.[34,38,47]

Sexual expression and behavior are also likely to be affected in the broader sense, that is, in the outward expression of femininity; for example, in terms of the appropriate choice of clothing in case of leakage.[48] In essence, a woman's perception of her own sexuality is jeopardized, leading to significant inhibition. Further stigma may ensue based on her partner's reaction.

How to measure the impact

To evaluate the impact of urinary incontinence on quality of life, a number of questionnaires have been developed and validated (**TABLE 3**).[42,49–66] These measure the severity of urinary symptoms and their impact on activities of daily living, physical activities, social interactions, personal relationships, and self-perception; some specifically address the impact on sexual function.

The King's Health Questionnaire, the Incontinence Quality of Life Instrument (I-QoL), and the Incontinence Impact Questionnaire (IIQ) contain one or two questions to evaluate the impact on the enjoyment of sex, on sex life, or on sexual relations. The Bristol Female Lower Urinary Tract Symptoms (B-FLUTS) questionnaire[42] includes four questions relating to sexual function:

- Pain or discomfort due to a dry vagina
- Sex life spoiled by urinary symptoms
- Pain on sexual intercourse
- Leakage on intercourse.

This questionnaire has been used to evaluate the effectiveness of pelvic floor muscle training on quality of life and sexual health[43] and to determine the effect of urinary incontinence on sexual activity in a community-based population (see below).[66]

The Pelvic Organ Prolapse/Urinary Incontinence Sexual Function Questionnaire (PISQ) was developed and validated in women with symptoms of either pelvic organ prolapse or urinary incontinence.[49] This questionnaire focuses specifically on urinary incontinence and sexual health and comprises behavioral-emotive, physical, and partner-related domains. A short form of the questionnaire, the PISQ-12, is also available.[59] Currently, the PISQ is the only condition-specific sexual function questionnaire dedicated to women with urinary incontinence. Questionnaires to specifically assess sexual function irrespective of continence status may also be of some value to measure the impact of stress urinary incontinence on sexual function (**TABLE 3**).

Many women do not seek treatment for incontinence

DOES TREATING INCONTINENCE RESTORE SEXUAL SATISFACTION?

Pelvic floor muscle training

Pelvic floor exercises have been shown to reduce symptoms of urinary leakage in women with stress urinary incontinence,[67,68] improve quality of life in general[43] and, more specifically, improve overall sex life.[43] In a study by Bo et al,[43] urinary incontinence with intercourse was reduced by nearly 50% in women who performed pelvic floor exercises vs less than 10% in the control group, who received no intervention.[43]

Regrettably, studies have generally been small and lacked an appropriate control, and outcomes measures have been inconsistent across trials. Despite this, pelvic floor exercises pose little potential for harm and are of minimal cost; therefore, they should be considered a first-line treatment for stress urinary incontinence. For women with both stress incontinence and sexual dysfunction, pelvic floor exercises present a unique option that may be effective for both conditions.

Surgery

Surgical treatment of stress urinary incontinence is recommended when more conservative treatment has failed.[69] In a US study using a mailed survey, 4% of 24,000 community-dwelling women reported a history of continence surgery.[7] Unfortunately, assessing the efficacy of various surgical methods is problematic due to inadequate case definitions, use of unvalidated outcome tools, inconsistent outcome measures, and concerns over the inability to generalize the results.[70] In spite of this, two systematic reviews have concluded that retropubic colposuspension (the Burch and Marshall-Marchetti-Krantz procedures) and placement of a suburethral sling are the most effective surgical procedures for treatment of stress urinary incontinence.[69,70]

Pelvic floor exercises are the first-line treatment for stress urinary incontinence

Minimally invasive outpatient procedures introduced more recently, such as the tension-free vaginal tape or "TVT" procedure, have a reported efficacy similar to that for the Burch colposuspension procedure at 2 years.[71]

Surgery is not without risk, even though it is effective in many cases. As many as 23% of patients who undergo surgery for stress incontinence develop postoperative voiding dysfunction, and 10% develop new-onset detrusor overactivity.[72] In addition, 3% to 9% of patients treated surgically have been reported to have urinary tract injury.[73,74]

Cure rates with surgery range from 51% to 91%, depending on the analytic methods, the length of follow-up, and the definition of cure.[69,71] Several studies have demonstrated that surgery for stress incontinence can result in an improvement in sexual function,[41,44,75,76] although there is also potential for reduced sexual enjoyment in a subset of surgically treated women.

Sexual dissatisfaction after surgery is often due to dyspareunia,[76,77] but orgasmic dysfunction has also been reported to play a role.[41] In addition, feelings of anxiousness and distress from worrying about potential urinary leakage during sexual activity may not be resolved once stress incontinence is treated. This, together with unrealistic patient expectations,[41] may also explain the sexual dissatisfaction after surgery in some women.

Drug therapy

No drug has yet been approved worldwide for treating stress urinary incontinence, although alpha-adrenergic receptor agonists and tricyclic antidepressants have been used off-label.[78] Estrogen preparations, both systemic and topical, have also been used, but several randomized trials have not found them to be effective.[79] There is some evidence, however, that estrogen may be useful for treating urge incontinence and other irritative voiding symptoms.[80] Furthermore, topical estrogen therapy can be effective for treating vulvovaginal atrophy and vaginal dryness,[81] which can contribute to sexual dysfunction in postmenopausal women.

Educate patients about what to expect

While stress incontinence and sexual dysfunction often coexist, stress incontinence may not be the prime cause of sexual dysfunction in many women. To successfully address a woman's individual needs, one should consider sexual dysfunction in the larger context of all factors that could contribute to it. It is also important that the patient's expectations be reasonable: ie, she should know that, while treatment may reduce symptoms during sexual activity, no cure is guaranteed.

IMPLICATIONS FOR PRIMARY CARE PHYSICIANS

Both stress urinary incontinence and sexual dysfunction affect many women and significantly worsen quality of life. Yet women are often reluctant to volunteer information about their symptoms because of the stigma attached to these problems.

Given the psychosocial consequences of these conditions and the increasing availabili-

ty of safe and effective treatments, primary care physicians should be prepared to ask about these disorders. One way is to add simple questions such as "Do you leak urine during physical activity or when you cough or sneeze?" and "Do you have any difficulties with your sex life?" to the review of systems during routine health screenings and annual gynecologic examinations. The urinary incontinence and sexual function questionnaires in **TABLE 3** are also useful for this.

Many women with stress urinary incontinence may leak urine during sexual intercourse, with potential for immediate embarrassment and decreased desire and avoidance of sexual activity in the longer term. Quality research is needed to further characterize the relationship between these two conditions and to further elucidate the impact, whether positive or negative, of treatment of stress incontinence on the sexual function of women.

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