Narrative Review

Peripartum Urinary Incontinence and Overactive Bladder

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Stress urinary incontinence (SUI) and urgency urinary incontinence (UUI) and symptoms of urgency, frequency, and nocturia are prevalent during pregnancy and the postpartum period but often are underestimated. Overactive bladder, including UUI, affects nearly 65% of patients during pregnancy. Postpartum SUI particularly is associated with mood disorders. Despite the association, many women delay seeking care. Effective treatments for urinary incontinence are available, and timely peripartum screening supports early intervention and enhances quality of life.

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Stress urinary incontinence (SUI) and urgency urinary incontinence (UUI) and symptoms of urgency, frequency, and nocturia are prevalent during pregnancy and the postpartum period but often are underestimated.[1] Stress urinary incontinence affects 30–70% of women in pregnancy and 6–54% of women postpartum.[1–5] Up to 11% of women report SUI 10 years postchildbirth, increasing to 20% with multiple vaginal deliveries.[5] Overactive bladder, including UUI, affects nearly 65% of patients during pregnancy.[6] Despite the association, many women delay seeking care due to uncertainty about where to seek help or embarrassment discussing symptoms with health care professionals.[7] Postpartum SUI particularly is associated with mood disorders, with up to 30% of women with SUI screening positive for postpartum depression.[8,9] Effective treatments for urinary incontinence are available, and timely peripartum screening supports early intervention and enhances quality of life.

PATHOPHYSIOLOGY OF STRESS URINARY INCONTINENCE IN PREGNANCY AND POSTPARTUM

During pregnancy, the urinary system is subjected to a variety of physiologic changes that can lead to *stress urinary incontinence* (SUI), the involuntary leakage of urine with increased abdominal pressure. Symptoms begin early in the first trimester and continue throughout pregnancy and are influenced by physical and hormonal factors such as increased abdominopelvic pressure from the gravid uterus, hormonal influence on urethral function, bladder neck mobility changes, and changes in urethral closure pressures. Increased bladder neck mobility and lower urethral closure pressures often are noted in patients who experience SUI after vaginal delivery, and they are significantly worse after operative delivery.[10,11]

PATHOPHYSIOLOGY OF OVERACTIVE BLADDER IN PREGNANCY AND POSTPARTUM

A variety of physiologic changes contribute to overactive bladder (OAB) symptoms in pregnancy, with 80–95% of women experiencing urinary frequency, urgency, urgency urinary incontinence (UUI), and nocturia starting as early as the first trimester.[2,12] Hemodynamic changes such as increases in blood volume and systemic vasodilation result in increased cardiac output, renal perfusion, and glomerular

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filtration rate as well as changes in bladder capacity. For many individuals, once the gravid uterus leaves the bony pelvis in the second trimester, transient relief in OAB symptoms can occur; however, as the gravid uterus continues to enlarge, symptoms typically recur. Lower extremity edema also is common in the later potion of pregnancy, and the resultant fluid mobilization that occurs with the supine position during sleep can contribute to nocturia.

Postpartum OAB symptoms are common, mainly due to transient neuromuscular changes from labor and delivery. Nearly 80% of women will experience an obstetric laceration at the time of vaginal delivery.[13] Additionally, during the second stage of labor, the levator ani muscles are at high risk for stretch injury and nerve compression.[14,15] Together, these changes can result in pelvic floor muscle weakness and impaired sensation, and can negatively affect bladder storage and emptying. Increased fluids diuresis postpartum can contribute to OAB symptoms, as well as increased fluid consumption if the mother is breastfeeding.

ROLE OF ESTROGEN AND LACTATION

Postpartum breastfeeding is associated with urinary incontinence (UI) in approximately 30% of individuals, potentially due to lactation-related hormonal shifts. Increased prolactin lowers estrogen (Fig. 1), creating a hypoestrogenic state that leads to genitourinary symptoms such as dryness, dyspareunia, and UI. These symptoms are known as *genitourinary syndrome of menopause* in postmenopausal individuals; the term *genitourinary syndrome of lactation* describes the same symptoms in breastfeeding individuals due to lactation-induced hypoestrogenism.[16] Muscle layers of the urethra that contribute to urethral closure pressure contain estrogen receptors. Therefore, decreases in estrogen during lactation may compromise closure pressure, increasing SUI risk. Although no studies have examined the effect of vaginal estrogen on SUI in breastfeeding women, research in postmenopausal women suggests potential benefit of topical estrogen supplementation.[17] It is then possible that estrogen supplementation during lactation may help alleviate SUI. However, further research is needed to determine the specific effect on this patient population.

NATURAL HISTORY OF URINARY INCONTINENCE POSTPARTUM

Because up to 40% of women will experience UI postpartum, it is helpful to provide patients with anticipatory guidance on its natural history. A systematic review found a mean prevalence of any UI to be 33% at 3 months postpartum, with weekly UI episodes at a mean prevalence of 12% and daily UI episodes at a mean prevalence of 3%.[18] The mean prevalence of UI was greater in individuals who had vaginal delivery compared with cesarean delivery (31% vs 15%).

For many patients, UI symptoms will improve or resolve during the fourth trimester. However, a longitudinal cohort study that followed patients from 3 months to 12 years postpartum found that approximately three-quarters of women who experienced UI at 3 months continued to report symptoms at 12 years.[19] Although there can be improvement between 3 and 6 months postpartum with normalization of the hormonal milieu, return to baseline body weight, neuromuscular recovery, and change in fluid consumption, according to expert opinion, it is reasonable to advise patients that UI that persists beyond 6 months is likely to continue long-term (though severity may vary) and that it warrants further evaluation and possible treatment by a urogynecologist.

CLINICAL RECOMMENDATIONS FOR STRESS URINARY INCONTINENCE SCREENING AND EVALUATION

Given that SUI increases as pregnancy progresses, targeted questions about involuntary urinary leakage during activities that increase abdominal pressure may be useful in standard prenatal check-ups. Although standardized questionnaires such as the UDI-6 (Urogenital Distress Inventory-6) and the IIQ-7 (Incontinence Impact Questionnaire-7) can provide useful information on severity of symptoms and association with quality of life, these have not been

Fig. 1. Increase in prolactin resulting in decreased ovarian production of estrogen, affecting urinary incontinence. GnRH, gonadotropin-releasing hormone; LH, luteinizing hormone; FSH, follicle-stimulating hormone.

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validated in the peripartum population.[20] Beyond questionnaire screening, we do not routinely perform further evaluation for SUI during pregnancy unless the patient has significant bother and desires an intervention. Postpartum patients may experience gradual improvement in UI symptoms such that they no longer have significant bother or require therapy.[6]

A basic evaluation for SUI if a patient remains symptomatic and bothered beyond 6 weeks postpartum is indicated. The evaluation begins with an assessment of urethral hypermobility and urine postvoid residual. *Urethral hypermobility*, defined as a 30° or greater deviation from the horizon, on visual examination is highly predictive of clinically significant SUI.[21] Hypermobility is assessed during a cough stress test, a provocative maneuver that is simple and widely accepted to reproduce patient symptoms. A cough stress test is conveniently performed when the patient is undergoing vaginal examination in the supine or lithotomy position. There are no standardized guidelines for preferred bladder volumes at the time a cough stress test is performed. However, researchers find that a bladder volume of around 300 mL is optimal for accurate assessment, because urine leakage can be observed in approximately 95% of patients with SUI when a cough stress test is performed.[22]

CLINICAL RECOMMENDATIONS FOR OVERACTIVE BLADDER SCREENING AND EVALUATION

Because urinary frequency is a common physiologic change associated with pregnancy, additional evaluation is not indicated beyond routine prenatal care. Dysuria, suprapubic pain, and hematuria in pregnancy should prompt evaluation for infectious process with a urinalysis and urine culture. Aside from avoiding catheterized urine collection–due to the increased risk of infection–no special evaluation is required in pregnancy. The evaluation for OAB and SUI in the postpartum period follows the same approach as in nonpostpartum patients.

Symptoms of OAB that persist postpartum in the absence of infection should be evaluated first by a postvoid residual urine measurement to rule out urinary retention. The preferred evaluation method is by having the patient void and then using a bladder scanner to detect residual urine. If a bladder scan is not available, a sterile straight catheterization could be performed postvoid to assess for residual urine. If a normal postvoid residual urine measurement is obtained, symptoms are likely attributable to postpartum neuromuscular changes, which are typically transient. A pelvic examination that assesses the pelvic floor musculature should be performed to assess for weakness by asking the patient to squeeze the pelvic floor during digital examination. Conversely, the pelvic floor muscles should also be palpated to assess for high resting tone and tenderness.[23] Both weakened pelvic floor and high-tone pelvic floor can contribute to postpartum OAB symptoms; thus, assessing for both to tailor treatment is important.

CONSERVATIVE MANAGEMENT OPTIONS FOR PERIPARTUM STRESS URINARY INCONTINENCE AND OVERACTIVE BLADDER

Behavioral and Lifestyle Modifications

Similar to nonpregnant individuals, behavioral modifications are one of the first steps in managing urinary symptoms during pregnancy and postpartum. Treatment strategies include practicing urge suppression techniques and bladder training, with the goal of aiming to urinate every 2–3 hours while awake. A bladder diary can be useful to help identify patterns of urgency and frequency. Cutting back fluids 2–3 hours before bed and leg elevation or compression stocking use, if edema is present, can help reduce nocturia. Inquiring about fluid intake, including volumes, timing, and types of fluids consumed, can sometimes be elucidative. Limiting bladder irritants such as caffeine and carbonated drinks, as well as avoiding excessive fluid consumption can improve urgency and frequency.

Pelvic Floor Muscle Exercises and Guided Pelvic Floor Physical Therapy

Pelvic floor muscle exercises, often referred to as Kegel exercises or pelvic floor squeezes, are widely recognized as a first-line treatment for SUI and OAB. Pelvic floor muscle exercises can be adjusted for the specific clinical scenario present. If the pelvic floor is weak, the focus can be on strengthening and squeeze exercises. On the other hand, if high-tone pelvic floor dysfunction is detected, pelvic floor muscle exercises can emphasize coordination and relaxation, which may help alleviate postpartum OAB symptoms. Women who consistently engage in regular pelvic floor muscle exercises are less likely to experience SUI in the third trimester, a period when increased abdominal pressure due to the growing uterus puts additional stress on the pelvic floor.[24]

The protective benefits of pelvic floor muscle exercises extend into the postpartum period. Studies show women who practice pelvic floor muscle exercises during pregnancy are less likely to have

persistent UI symptoms up to 12 weeks postpartum.[25] And, if performed immediately postpartum, pelvic floor muscle exercises can potentially prevent SUI at 1 year.[26] Woodley et al recommends a regimen involving eight contractions, with 8-second holds, three times a day, 3 days a week, for at least 3 months to prevent SUI.[27] Reduction in postpartum incontinence would likely be due to the improved strength and coordination of the pelvic floor muscles, which helps hasten recovery after childbirth and contributes to better bladder control.

Both supervised and at-home pelvic floor physical therapy have been shown to benefit patients with SUI and OAB. Pelvic floor physical therapy helps patients not only strengthen pelvic floor muscles but also improve muscle coordination, ensuring proper relaxation and contraction–key elements for optimal bladder function. Standardized pelvic floor physical therapy has demonstrated significantly better outcomes compared with no intervention, with guided instruction from a trained specialist providing additional benefits. Patients who consistently attend pelvic floor physical therapy sessions may experience up to a 30% reduction in SUI symptoms.[28]

Home Pelvic Floor Training Devices

Commercially available home pelvic floor training devices have been proven to be effective in reducing rates of SUI.[29] Weighted vaginal cones help strengthen pelvic floor muscles by requiring users to engage them to prevent the cones from expelling, potentially reducing postpartum UI compared with those who only do pelvic floor muscle exercises.[30] There are also home digital motion devices paired with remote coaching that have been shown to improve both SUI and OAB symptoms, compared with home pelvic floor muscle exercises alone, such as the Leva Pelvic Health System, which has an intravaginal motion sensor paired with an app-based software program that aids in strengthening and rehabilitating weak pelvic floor muscles.[31] However, these devices should be used after informed discussions between patient and health care professionals due to variability in insurance coverage, accessibility of digital health tools and because the devices have not been validated in pregnancy or postpartum periods.[32]

MANAGEMENT OPTIONS FOR PERIPARTUM STRESS URINARY INCONTINENCE

Pessaries and Vaginal Continence Devices

Although, to our knowledge, there are no studies that directly investigate the use of an incontinence pessary in pregnancy, pessary use has been demonstrated to be a safe conservative treatment during pregnancy for pelvic organ prolapse and uterine incarceration.[33] Contraindications, similar to those in the general population, include active vaginal infection or unexplained vaginal bleeding. In pregnant patients, regular follow-up is crucial to monitor for fit, comfort, and potential complications, such as epithelial irritation or ulceration.

In postpartum patients, conservative treatments such as pelvic floor muscle exercises or pessary use are the first-line treatments for SUI. Though research in this area is limited, some studies suggest vaginal pessaries may be more effective than pelvic floor muscle exercises in reducing postpartum SUI symptoms.[34] No single incontinence pessary type has demonstrated superiority in improving postpartum incontinence; however, for the general population, a ring pessary with knob is the most beneficial for SUI.[35] Specific to postpartum patients, one study examined the effectiveness of the Restifem pessary, which is approved for postpartum SUI, and found there to be a reduction in symptoms as well as ease of use with patients.[36]

Over-the-counter vaginal continence devices such as Revive and Poise Impressa Bladder Supports are approved for postpartum SUI.[37,38] However, no studies have directly investigated efficacy in SUI reduction with these devices and neither are approved for use during pregnancy. One randomized controlled trial found that both Poise Impressa Bladder Supports and continence pessaries improve scores on the UDI-6 after 4 weeks of use.[39]

Urethral Bulking for Postpartum Stress Urinary Incontinence

Urethral bulking is a transurethral endoscopic procedure that can be performed in the office setting and is an alternative to other surgical management options for SUI. It is a quick procedure involving injection of an implant to restore urethral mucosa coaptation. Although there is a paucity of data on the use of urethral bulking in the postpartum population, given the minimally invasive nature of the procedure, it may be a favorable alternative to surgical options in patients who have persistent SUI at least 3–6 months postpartum. Available research in postpartum patients has been limited to case reports that demonstrate good results with SUI resolution.[40]

Midurethral Sling for Postpartum Stress Urinary Incontinence

A midurethral sling procedure involves placing a piece of mesh in a tension-free fashion under the midurethra

using a vaginal incision. Traditional practice has been to delay placement of a midurethral sling for SUI until a patient has completed childbearing. However, more recent retrospective data have demonstrated that midurethral slings remain effective after both vaginal and cesarean deliveries without adverse pregnancy outcomes.[41–43] This remains a nuanced discussion between the patient and their health care professional based on degree of SUI symptom bother and future childbearing goals. In our practice, placement of a midurethral sling should be delayed until at least 6 months postpartum given the natural history of SUI, as discussed previously. For those wishing to avoid mesh, the Burch colposuspension or autologous fascial sling may be considered, though a detailed discussion is beyond this article's scope.

MANAGEMENT OPTIONS FOR PERIPARTUM OVERACTIVE BLADDER

Postpartum OAB symptoms typically resolve with time and pelvic floor muscle exercises as neuromuscular function normalizes after delivery. Additionally, for lactating women who drink increased amounts of water for hydration, some increase in urinary frequency above baseline is expected and is not typically in need of further management. We hesitate to start any anticholinergic or beta-3 agonist medication for OAB postpartum in lactating women given the concern about effects on the neonate and breast milk production. Although the data are limited, one study found that pregnant women who take OAB anticholinergic medications have a higher risk of pregnancy complications compared with non-OAB anticholinergic medication users, but there was no increased risk of congenital malformations.[44] For individuals who have persistent, bothersome OAB symptoms and are not breastfeeding, consideration of second-line therapy with an OAB medication is reasonable after behavioral and lifestyle modifications have been implemented. OnobotulinumA toxin is not recommended in breastfeeding individuals; however, a case series of women receiving cosmetic botulinum toxin injections found very low or no botulinum toxin levels in expressed breast milk.[45] Encouragingly, many OAB symptoms improve as the pelvic floor heals after delivery, obviating the need for procedural intervention.[6]

COUNSELING PATIENTS ON SYMPTOMS AND TREATMENT EXPECTATIONS

It is essential to reassure patients that UI is common during and after pregnancy. We encourage open dialogue and validating concerns when symptoms are bothersome. To support these conversations, we recommend the following approach with respect to screening and management.

Screening

During pregnancy, it is crucial to ask targeted questions about urinary leakage during activities that increase abdominal pressure, such as coughing or sneezing. We recommend screening at least once, ideally in the third trimester when symptoms are most prevalent. Postpartum, we recommend screening at the 6-week visit and continuing to assess as needed every 3–6 months for bothersome symptoms. Although tools such as the UDI-6 or IIQ-7 offer insights, clinical conversations are more meaningful, because these questionnaires are not validated for peripartum populations. Simple, direct questions, such as the following, can effectively guide the discussion and identify patients who may benefit from further support or intervention:

- "Do you experience urine leakage with physical activity?"
- "Do you leak urine with a sudden urge to void?"
- "How do your urinary symptoms affect for physical and mental well-being?"
- To what degree are you able to participate in social activities outside of your home?

Management

Conservative management is key. Patients should be encouraged to begin pelvic floor muscle exercises as soon as they feel comfortable, and they should be encouraged to begin bladder training and fluid management and to avoid bladder irritants such as caffeine. It is important to reassure patients that postpartum UI often improves naturally and early pelvic floor muscle exercises can aid recovery. Procedural options for SUI or pharmacologic therapy for OAB are reserved for persistent symptoms.

Key Counseling Messages

- "These symptoms are common and usually improve over time, but you don't have to live with them."
- "There are many noninvasive treatments we can try first–let's start with what fits your lifestyle."
- "If things don't improve, we can explore more advanced options."

CONCLUSIONS

Peripartum UI and OAB are highly prevalent in pregnant and postpartum populations. For many individuals, this is the first experience with a pelvic

floor disorder. Although pregnancy and postpartum factors contribute to the onset of these conditions, and recovery from pregnancy often promotes their resolution, it is important to screen this unique population for bothersome UI, because many patients will not volunteer their concerns without being asked directly. A variety of effective treatments are available for pregnant and postpartum individuals. Initiating and incorporating UI discussions in the peripartum period is important for educating patients on their symptoms, promoting effective strategies to improve bother, and, when needed, directing patients to subspecialists who can further evaluate and manage patients.

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PEER REVIEW HISTORY

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