Diagnosis and Management of Urinary Incontinence

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Learning Objectives

• Apply diagnostic and treatment strategies for stress incontinence

• Apply diagnostic and treatment strategies for urge incontinence

• Evaluate effective treatment options for refractory urge and stress incontinence

Prevalence of Overactive Bladder (OAB) in the US

- Overall, 16.6% had symptoms of OAB
- Prevalence of OAB increased with age
- Women more likely to be incontinent


Incontinence - Underreported

- Less than half of patients with incontinence report it to their health care provider

- Reasons for not reporting incontinence:
  - Embarrassment
  - Low expectation for therapy
  - “Normal” part of aging
  - Availability of absorbent products/pads

Impact of Urinary Incontinence on Quality of Life

Physical
- Limitations or cessation of physical activities

Psychological
- Guilt/depression
- Loss of self-respect and dignity
- Fear of:
  - Being a burden
  - Lack of bladder control
  - Urine odor
- Apathy/denial

Sexual
- Avoidance of sexual contact and intimacy

Occupational
- Absence from work
- Decreased productivity

Social
- Reduction in social interaction
- Alteration of travel plans
- Increased risk of institutionalization of frail older persons

Domestic
- Requirements for specialized underwear, bedding
- Special precautions with clothing


Types of Incontinence

1. Overflow incontinence
2. Urge incontinence (overactive bladder)
   - Overwhelming urge to urinate results in leakage
   - Unintended detrusor activity
3. Stress incontinence
   - Sudden involuntary loss of urine associated with increase in intra-abdominal pressure (cough, sneeze)
   - Failure of sphincter - intrinsic or extrinsic factors
4. Mixed incontinence

Different Degrees of Incontinence

Overactive Bladder
- OAB “wet”
- OAB “dry”

SUI, stress urinary incontinence
UUI, urge urinary incontinence

Differentiation Diagnosis: Overactive Bladder, Stress Incontinence, and Mixed Symptoms

Medical History and Physical Examination

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Overactive bladder</th>
<th>Stress incontinence</th>
<th>Mixed symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urgency (strong, sudden desire to void)</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Frequency with urgency (≥8 times/24 h)</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Leaking during physical activity, eg, coughing, sneezing, lifting, etc.</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Amount of urinary leakage with each episode of incontinence</td>
<td>Large (if present)</td>
<td>Small</td>
<td>Variable</td>
</tr>
<tr>
<td>Ability to reach the toilet in time following an urge to void</td>
<td>Often no</td>
<td>Yes</td>
<td>Variable</td>
</tr>
<tr>
<td>Waking to pass urine at night</td>
<td>Usually</td>
<td>Seldom</td>
<td>Maybe</td>
</tr>
</tbody>
</table>


History

- How long? How old when started?
- When does leakage occur?
  - Day and night, wet pads at night suggest OAB
  - Activity related?
- How much (volume)? Degree of bother?
- Urgency?
  - Suppressible suggests stress urinary incontinence
  - Not suppressible (urge incontinence) suggests OAB
- Prior surgeries?
- Other: fluid intake, UTI’s, pain, hematuria, LE swelling, prolapse, medications?

Urinary Incontinence Evaluation History - Other Causes of Symptoms

- Local Pathology
  - Infection
  - Bladder stones
  - Bladder tumor
  - Interstitial cystitis
  - Outlet obstruction
- Metabolic
  - Diabetes
  - Polydipsia
- Medications
  - Diuretics
  - Antidepressants
  - Antihypertensives
  - Hypnotics & sedatives
  - Analgesics & narcotics
- Other Factors
  - Pregnancy
  - Psychological
  - Estrogen deficiency
OAB Symptoms May Be Worsened by...

<table>
<thead>
<tr>
<th>Sedatives</th>
<th>Confusion, secondary incontinence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol, caffeine</td>
<td>Diuresis</td>
</tr>
<tr>
<td>Anticholinergics other than antimuscarinics</td>
<td>Impair detrusor contractility, Voiding difficulty, Overflow incontinence</td>
</tr>
<tr>
<td>α-Agonists</td>
<td>Increase outlet resistance, voiding difficulty</td>
</tr>
<tr>
<td>β-Blockers</td>
<td>Decrease urethral closure, Stress incontinence</td>
</tr>
<tr>
<td>Calcium-channel blockers</td>
<td>Reduce bladder smooth muscle contractility</td>
</tr>
<tr>
<td>ACE inhibitors</td>
<td>Induce cough, stress urinary incontinence</td>
</tr>
</tbody>
</table>

Other Considerations

- Identify and treat reversible conditions
- Think “DIAPPERS” acronym
  - D: dementia/delirium
  - I: infection
  - A: atrophic vaginitis/urethritus
  - P: psychological (depression)
  - P: pharmacologic
  - E: excessive urine output
  - R: restricted mobility
  - S: stool impaction

Physical Examination

- Abdomen
  - Masses: palpable bladder, etc.
- Pelvis/perineum
  - External genitalia: atrophic vaginitis
  - Vaginal
    - Prolapse (assoc. 50% of SUI patients)
    - GYN malignancy, fistula
- Rectal:
  - Tone, masses, teach Kegels during exam
  - Prostate
- Neurological (reflexes, LE’s, sensory, motor)

Other studies:

- Urine Analysis:
  - Hematuria, pyuria, glucosuria, etc.
- Post-void residual: ultrasound, catheter
- Voiding diary
- Urodynamics
- Cystoscopy

Urodynamics

- Urodynamics: pressure test of bladder to document when leakage occurs, neurologic integrity of bladder
  - Useful in complex cases
  - When diagnosis may change treatment
  - Not required in all cases
  - Specialized center of excellence

Urge Incontinence:

Treatment Options
Treatment for Overactive Bladder

- Pads
- Behavioral therapy
- Medications
- Neuromodulation
- Botulinum toxin
- Surgery

Dietary/Lifestyle Modification

- Reduce daytime and nighttime fluids\(^1\)
- Eliminate bladder irritants\(^1\)
  - Caffeine, carbonated beverages, alcohol, nicotine
- Evaluate and modify bowel habits\(^1\)
  - Add fiber to diet
- Weight loss
  - Obesity increases intra-abdominal pressure\(^2\)
  - Leads to weakening of pelvic floor innervation and musculature\(^2\)
  - Weight reduction of 5% can reduce severity of urinary incontinence and its effects on QoL in obese women\(^1\)

Pelvic Floor Muscle Exercises

- Daily regimen of Kegel exercises strengthens pelvic floor muscles, improves bladder stability\(^3\)
  - Tighten/contract pelvic floor muscles, hold for 5 s, then relax for 5 s.
  - Work up to contracting for 10 s, relaxing for 10 s
  - Aim for 2-3 sets of 10 repetitions daily
- Used primarily in patients with SUI, but may be beneficial in mixed incontinence, OAB\(^2\)
  - Effect greatest in younger women (40s–50s) in supervised program for \(\geq 3\) mo\(^2\)
  - Addition of biofeedback helps teach patients how to identify and contract pelvic floor muscles\(^1\)

Additive Effect of Combining Behavior and Drug Therapies

<table>
<thead>
<tr>
<th></th>
<th>Behavior Therapy</th>
<th>Combined Therapy</th>
<th>Drug Therapy</th>
<th>Combined Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Reduction in UI (%)</td>
<td></td>
<td>(-57.5%)</td>
<td>(-85.5%)</td>
<td>(-72.7%)</td>
</tr>
</tbody>
</table>

\(^1\) Burgio KL. Urology. 2002;60(5 Suppl 1):72-76.
Oral Antimuscarinics

- Thought to suppress bladder afferent activity by inhibiting effects of acetylcholine at postjunctional muscarinic receptors on 
  - Detrusor smooth muscle
  - Other structures in the bladder wall such as the urothelium, interstitial cells, and afferent nerves
- Also affect muscarinic receptors throughout the body (eg, salivary gland, colon, ciliary smooth muscle), causing common adverse events (AEs) that limit clinical use
  - Common AEs: dry mouth, constipation, blurred vision
  - Patients with dry mouth often increase fluid intake, worsening OAB


Antimuscarinics: A Balancing Act

<table>
<thead>
<tr>
<th>Efficacy</th>
<th>AEs</th>
</tr>
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<tbody>
<tr>
<td>↓ Frequency</td>
<td>Dry mouth</td>
</tr>
<tr>
<td>↓ Urgency</td>
<td>Constipation</td>
</tr>
<tr>
<td>↑ Urge Incontinence</td>
<td>CNS</td>
</tr>
<tr>
<td>↑ Voided volume</td>
<td></td>
</tr>
</tbody>
</table>

Cost

Patient Adherence is a BIG Problem

- Database of 29,369 women aged ≥18 yo prescribed anticholinergic medications
  - Median time to discontinuation: 4.8 mo
  - 58% still on medication at 6 mo, <23% at 1 year
- National Family Opinion Survey (n=5392 on OAB medication in past year)
  - 1322 stopped medication
  - Reasons for stopping (89%)
    - Unmet expectations
    - Side effects
    - Switched medications


Strategies to Reduce AEs

- Dose reduction (when dosing options available) can provide relief from AEs while retaining some therapeutic effects
- Try alternate agent that the patient may tolerate better
- Transdermal patch or gel may also be offered
- Older patients may metabolize drugs differently, so start with minimal dose, increase if it is tolerated well


Beta 3 Agonist for OAB

- MOA distinct from antimuscarinics
  - Detrusor smooth muscle relaxation and increased bladder stability during filling/storage via direct activation of β3-adrenoceptors
  - Increases bladder capacity without change in micturition pressure or post-void residual volume

Beta 3 Agonist for OAB

- Mirabegron approved by FDA, June 2012
  - 25 mg, 50 mg doses
- Phase 2 and 3 trials support safety and efficacy\(^1-6\)
  - Consistently reduced mean number of micturitions and incontinence episodes per 24 h
  - Common AEs similar across all treatment and placebo groups
  - Hypertension, dry mouth, headache, UTI, nasopharyngitis
- Potential benefits: no antimuscarinic AEs, no voiding dysfunction/retention in men\(^6\)
- Value as primary or add-on therapy\(^v\)

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Options for Refractory Urge Incontinence Patients / Referral to Urologist

Third-line treatments
- Peripheral tibial nerve stimulation (PTNS)
- Detrusor neuromodulation (onabotulinumtoxinA)
  - Patients must be able and willing to return for frequent post-void residual evaluation and perform self-catheterization if necessary
- Sacral neuromodulation
  - Patients with severe refractory OAB willing to undergo surgery

Additional treatments
- Indwelling catheters
  - Not recommended for OAB because of adverse risk/benefit balance except as a last resort in selected patients
- Augmentation cystoplasty or urinary diversion
  - Used in rare cases for severe, refractory, complicated OAB

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Peripheral tibial nerve stimulation (PTNS)

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Case #2

- 66 year old female with hx of urge, freq and urge incontinence
- Voiding diary (3 days): avg voids 3-4oz, 14-16 voids a day and avg: 5-7 leaks a day
- Tried and failed meds (antichol) x 3
- PMH: NIDDM, HPTN
- PSH: TKA, GB
- MEDS: ace inhibitor and glipizide

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Case #2 continued

- Physical Exam:
  - Urethra: no hypermobility, no stress incontinence
  - Vagina: +cystocele, apex well supported
  - Neuro: no focal abnormalities
  - Abd: no mass, bladder non palp
  - PVR: 55 cc
- Urine: negative
- What to do:
  - Another medication?
  - Behavioral modifications and PF exercises?
  - Refractory steps

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Stress Incontinence: Treatment Options
Case #3

• 43 year old G2P2, s/p 2 vaginal deliveries
• Main complaint is leakage with activity:
  • “I can’t run after my kids” or “jump on a trampoline”
  • “I stopped going to work out as I had to change a saturated pad in the middle of the class”
• PMH, PSH, Meds: none
• PE: stress incontinence, no prolapse,
• Options?

Management of Stress Incontinence (SUI)

• Pads and absorbent products
• Behavioral therapy
• Medications
• Surgery
  • Injectables
  • Slings

Pubovaginal Sling

Transobturator

Suprapubic

Transvaginal mesh

• Ideal mesh- inert, resistant to infection permanent with no risk of erosion, becomes incorporated into surrounding tissue.

• Materials used- polypropylene, polyester, PTFE, polyamide

• Material, structure and filament of the mesh determine the size of the interstices and pores
  • Knitted, monofilament meshes w interstices, micropore size >10 microns and pore size >75 microns allow for vascular, fibroblast and collagen fiber ingrowth

Complications of TV Mesh Placement

• Bladder perforation
• Hemorrhage
• Bowel perforation
• De novo urgency and obstruction
• Neurologic symptoms
• Infection
• Chronic pelvic pain
• Urinary retention
• Mesh erosion
Recent Update from US-FDA

- In particular, the literature review revealed that: Mesh used in transvaginal pelvic organ prolapse (POP) repair introduces risks not present in traditional non-mesh surgery for POP repair.
- Mesh placed abdominally for POP repair appears to result in lower rates of mesh complications compared to transvaginal POP surgery with mesh.
- There is no evidence that transvaginal repair to support the top of the vagina (apical repair) or the back wall of the vagina (posterior repair) with mesh provides any added benefit compared to traditional surgery without mesh.
- While transvaginal surgical repair to correct weakened tissue between the bladder and vagina (anterior repair) with mesh augmentation may provide an anatomic benefit compared to traditional POP repair without mesh, this anatomic benefit may not result in better symptomatic results.

Diagnosing Stress Incontinence in Men

- History
  - How many pads? Pad weight?
  - Level of bother?
  - Sexual dysfunction?
- Urodynamics
- Cystoscopy

Bulking Agents

- Off-label use
- Most minimally invasive
- Bovine Collagen
- Silicone microimplants
- Need for multiple injections
- Deterioration of effect over time
- Low cure rates

Case #5

- 47 year old female G3P3 with hx of mixed incontinence, stress and urge (50/50). Sx for at least 3 years, but prob since last child was born....
- Affecting QOL, reducing activities with kids
- Tried antichol and no help
- Tried Kegels and was “tired of doing them”
- PMH: none
- PSH: vaginal delivery x 3

Case 5 continued

- Meds: none
- PE:
  - + SUI on exam with cough
  - + cystocele, uterus and cervix well supp
- Urodynamics:
  - Detrusor overactivity and stress incontinence
- Next steps?
  - meds
  - PT
  - Surgery? If so, what type: treat urge or stress?

Case 5 continued

- If we treat the Stress incontinence: about 60% of patients improve both stress and urge (OAB) symptoms. Outpatient management.
- Postop: stress incontinence cured, still some mild residual OAB sympptoms (1 leak a day) especially in morning
- 3 day voiding log: 4 cups of coffee a day, diet coke x 4 and 64 oz of water
- Behavioral modification
- Came back, better, but still had some OAB despite behavorial modification, discussed pros and cons of meds (antichol) and Rx given
Novel techniques/material

• Stem cell therapy
  • Muscle or adipose derived as a regenerative tissue
• Adipose derived mesenchymal stromal cell

Summary: Urinary Incontinence

• Incontinence affects up to 43% of women and 27% of men with the prevalence increasing with age
  • Estimated 46 million Americans ≥ age 40
• Incontinence can significantly impact a patient’s quality of life
• Behavioral modification is very useful as monotherapy or as concomitant therapy for treating both stress and urge incontinence
  • A detailed history is the most important aspect of making the diagnosis

Summary: Urinary Incontinence

• Overactive bladder:
  • Medications, timed voiding, decrease fluids, Kegel exercises
  • Refractory patients should be referred for PTNS, bladder botox injections, or surgery
• Stress incontinence:
  • Mild cases: Kegels and behavioral modification
  • Injection therapy
  • Surgery
    • Injections
    • Sling/artificial urinary sphincter