Update on Urinary Incontinence

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Primary Goals

• Distinguish between the types of incontinence
• Describe the causes & risk factors for incontinence
• Describe how to evaluate incontinence
• Identify invasive & non-invasive treatments
Spectrum of Urinary Incontinence and OAB

- Urgency
- Frequency
- Nocturia

SUI

Mixed
\((UUI+SUI)\)

UUI

OAB

SUI

Mixed
\((UUI+SUI)\)

UUI

OAB
## Differential Diagnosis:
### OAB and Stress Incontinence

**Medical History and Physical Examination**

### Symptom Assessment

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Overactive bladder</th>
<th>Stress incontinence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urgency (strong, sudden desire to void)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Frequency with urgency (&gt;8 times/24 h)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Leaking during physical activity; eg, coughing, sneezing, lifting</td>
<td>No</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>
</tr>
<tr>
<td>Ability to reach the toilet in time following an urge to void</td>
<td>Often no</td>
<td>Yes</td>
</tr>
<tr>
<td>Waking to pass urine at night</td>
<td>Usually</td>
<td>Seldom</td>
</tr>
</tbody>
</table>

Differentiating SUI from UUI

**SUI**

- Bladder muscle experiencing a stress-related contraction
- Visual depiction of stress incontinence
- Support muscles unable to remain completely shut

**UUI**

- Bladder muscle experiencing frequent involuntary contractions
- Visual depiction of overactive bladder
Put another way…
Prevalence of Types of Urinary Incontinence

Women Under 60 Years Old
- Stress: 55%
- Urge: 20%
- Mixed: 25%

Women Over 60 Years Old
- Stress: 30%
- Urge: 35%
- Mixed: 35%

Cost of Urinary Incontinence

- Direct cost of treating UI $19.5 billion
- 75% of which is spent on the treatment of women
- Of this, $14.2 billion were attributed to community residents and $5.3 billion to institutional residents

Impact of Urinary Incontinence

Quality of Life

Physical
• Limitations or cessation of physical activities

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

Sexual
• Avoidance of sexual contact and intimacy

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

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

Occupational
• Absence from work
• Decreased productivity
Evaluation

- History/Physical
- Urinalysis
- Questionnaires
- Voiding diaries
- Flow/Residual
- Urodynamics

History

- Nature of incontinence – when does it occur

- Severity of incontinence
  - Questionnaires
  - Pad Use

- Frequency/Urine volume: Voiding diaries
# Urogenital Distress Inventory

Do you experience and, if so, how much are you bothered by:

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>A little bit</th>
<th>Moderately</th>
<th>Greatly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequent urination</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Urine leakage related to urgency</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Urine leakage related to physical activity</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Small amounts of urine leakage (drops)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Difficulty emptying your bladder</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Pain or discomfort in the lower abdomen/genitalia</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Physical Exam

Assess for:

- Palpable bladder
- Vaginal prolapse
- Urogenital atrophy
- Vaginal Masses
- Leak with strain/cough
Overactive Bladder

Urinary urgency and frequency, often with nocturia – either with or without urge-related leakage episodes
Prevalence of OAB

- 16.6% of adult population
- 33.3 million adults

US Population ≈ 200 million adults

Prevalence of Overactive Bladder in the US

• Overall, 16.6% had symptoms of an overactive bladder.
• Prevalence of overactive bladder increased with age.

Causes of overactive bladder

• Neurogenic
  – MS, SCI, Parkinson’s, CVA

• Inflammatory conditions
  – IC, infections

• Dietary
  – Caffeine, alcohol, tobacco, spicy food, citrus

• Idiopathic
Treatments

- Behavioral modification
- Timed voiding
- Urge suppression/Pelvic Exercises
- Medical therapy
- Detrusor Botox injections
- Sacral electrical stimulation
- Surgery
Behavioral modification
Conservative therapies

- Timed voiding
- Dietary changes
- Urge Suppression
  - PFE at the time of urge episodes
- Biofeedback
Dietary Changes

- Spicy foods
- Citrus fruits
- Acidic foods
- Tobacco
- Caffeinated products
<table>
<thead>
<tr>
<th>Medication</th>
<th>Route</th>
<th>Typical dose</th>
<th>Cost/Advantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyoscyamine (Levsin and others)</td>
<td>Oral/Sublingual</td>
<td>.125-.75 mg bid-qid</td>
<td>SL form fast acting</td>
</tr>
<tr>
<td>Oxybutynin</td>
<td>Oral Intravesical</td>
<td>2.5-10 mg tid 5mg/30cc</td>
<td></td>
</tr>
<tr>
<td>Extended release oxybutynin</td>
<td>Oral</td>
<td>5-30mg qd</td>
<td>Serum levels stable</td>
</tr>
<tr>
<td>(Ditropan XL)</td>
<td>Transdermal</td>
<td>5 mg daily</td>
<td>Reduced levels metabolite</td>
</tr>
<tr>
<td>Oxybutynin Topical (Gelnique)</td>
<td>Transdermal</td>
<td>5 mg daily</td>
<td></td>
</tr>
<tr>
<td>Tolterodine (Detrol)</td>
<td>Oral</td>
<td>2-4 mg bid 4 mg qd</td>
<td>Bladder selectivity</td>
</tr>
<tr>
<td>Tolterodine LA (Detrol LA)</td>
<td>Oral</td>
<td>4-8 mg q day</td>
<td></td>
</tr>
<tr>
<td>Fesoterodine (Toviaz)</td>
<td>Oral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trospium (Sanctura)</td>
<td>Oral</td>
<td>20 mg bid</td>
<td>Quarternary amine ?Less CNS effects</td>
</tr>
<tr>
<td>Solifenacin (Vesicare)</td>
<td>Oral</td>
<td>5-10 mg qd</td>
<td>More selective</td>
</tr>
<tr>
<td>Darifenacin (Enablex)</td>
<td>Oral</td>
<td>7.5-15 mg qd</td>
<td>Receptor specific</td>
</tr>
<tr>
<td>Imipramine (Tofranil and others)</td>
<td>Oral</td>
<td>10-75 mg qhs</td>
<td>Nocturia/enuresis</td>
</tr>
</tbody>
</table>
Side effects/Continuation rates

• Dry Mouth
  – 20-30% for “new generation” anti-cholinergics

• Continuation rates for oxybutynin
  – Only 20-30% on drug at 1 year

• CNS side effects
  – <10% for all
  – Are elderly more susceptible?
Combination therapy

<table>
<thead>
<tr>
<th>Drug therapy alone (N = 18)</th>
<th>Switched to behavioral (N = 18)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>59.1%</td>
<td>77.1%</td>
<td>.109</td>
</tr>
<tr>
<td>Behavioral therapy alone (N = 8)</td>
<td>Drug therapy added (N = 8)</td>
<td>88.5%</td>
</tr>
<tr>
<td>57.5%</td>
<td></td>
<td>0.034</td>
</tr>
<tr>
<td>Drug therapy alone (N = 27)</td>
<td>Behavioral therapy added (N = 27)</td>
<td>84.3%</td>
</tr>
<tr>
<td>72.7%</td>
<td></td>
<td>0.001</td>
</tr>
</tbody>
</table>

Newest Pharmacotherapy Option

• Mirabegron 25-50 mg qd

• selective β3-adrenergic agonist → relaxation of bladder smooth muscle
# Overall incidence of treatment-emergent adverse events

<table>
<thead>
<tr>
<th>Preferred Term n (%)</th>
<th>Mirabegron 25 mg (n = 432)</th>
<th>Mirabegron 50 mg (n = 440)</th>
<th>Placebo (n = 433)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any AE</td>
<td>210 (48.6)</td>
<td>208 (47.3)</td>
<td>217 (50.1)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>49 (11.3)</td>
<td>47 (10.7)</td>
<td>37 (8.5)</td>
</tr>
<tr>
<td>Nasopharyngitis</td>
<td>15 (3.5)</td>
<td>25 (5.7)</td>
<td>14 (3.2)</td>
</tr>
<tr>
<td>Urinary tract infection</td>
<td>18 (4.2)</td>
<td>21 (4.8)</td>
<td>10 (2.3)</td>
</tr>
<tr>
<td>Headache</td>
<td>9 (2.1)</td>
<td>12 (2.7)</td>
<td>19 (4.4)</td>
</tr>
<tr>
<td>Upper respiratory tract infection</td>
<td>9 (2.1)</td>
<td>7 (1.6)</td>
<td>8 (1.8)</td>
</tr>
<tr>
<td>Dry mouth</td>
<td>8 (1.9)</td>
<td>7 (1.6)</td>
<td>9 (2.1)</td>
</tr>
<tr>
<td>Dizziness</td>
<td>10 (2.3)</td>
<td>4 (0.9)</td>
<td>2 (0.5)</td>
</tr>
<tr>
<td>Nausea</td>
<td>5 (1.2)</td>
<td>6 (1.4)</td>
<td>10 (2.3)</td>
</tr>
<tr>
<td>Back pain</td>
<td>6 (1.4)</td>
<td>4 (0.9)</td>
<td>9 (2.1)</td>
</tr>
</tbody>
</table>

S. Herschorn et al. J Urology 2013; 82, 313–320
Refractory OAB

• Sacral electrical stimulation (Interstim)
• Tibial neuromodulation (PTNS)
• Intravesical Botox
• Bladder augmentation/Diversion
Interstim
Percutaneous Tibial Nerve Stimulation

FDA approved Jan 2011
Indication – Refractory OAB
Failed 2 antimuscarinics
12 30 minute sessions
Botulinum-A injections

Augmentation cystoplasty
Stress Urinary Incontinence
Pathophysiology of Stress Urinary Incontinence

- Urethral hypermobility
  - displacement of urethra during sudden increase in intra-abdominal pressure
  - intra-abdominal pressure overrides urethral resistance
Pathophysiology of Stress Urinary Incontinence

• Intrinsic sphincter deficiency (ISD)
  – urethra is unable to generate enough outlet resistance to retain urine in bladder
### Differentiating SUI from UUI

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<tr>
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<th>SUI</th>
<th>UUI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initiating event</strong></td>
<td>Activity, movement</td>
<td>Unpredictable</td>
</tr>
<tr>
<td><strong>Volume urine loss</strong></td>
<td>Drops</td>
<td>Can be large volume</td>
</tr>
<tr>
<td><strong>Affected by diet</strong></td>
<td>Typically no</td>
<td>Typically yes</td>
</tr>
</tbody>
</table>
Major risk factors

• Gender
• Obesity
• Parity
  – # pregnancies
  – Incontinent during 1st pregnancy raises risk
  – birth weight of largest child
  – mode of delivery - controversial

Treatment options

- Behavioral
- Pelvic floor exercises
- Urethral/Vaginal devices
- Injectables
- Surgery
  - Open
  - Vaginal
Conservative strategies

- Behavioral
  - Weight reduction, smoking cessation, regulate fluid intake, timed voiding
Pelvic floor exercises

• Learn to do correctly
• Regimented program required
• Efficacy controversial, though clearly any effect lost once exercises stopped
• Requires motivated patient

• Biofeedback – teaches control of pelvic floor musculature by physiotherapist

Bo and Talseth, Obstet Gynec. 87: 261, 1996
Biofeedback
Intraurethral Devices

External retainer
Applicator
Stop
Fluid-filled sleeve
Tip
Balloon

Fluid transfer through insert
Intravaginal Support Devices: Continence Pessary

Injectable agents
Coaptite, Macroplastique, Durasphere

Before injection

After injection
Injectable agents

- 30 minute office procedure
- Minimal risk of voiding dysfunction
- Efficacy – 50-60%
- Re-treatments often required
Surgery

• Retropubic suspension (Burch)
• Vaginal bladder neck suspension
• Pubovaginal sling
• Minimally invasive tension free slings
  – TVT – trans vaginal tape
  – TOT – trans obturator tape
Burch and Sling

Efficacy – 85-90% at 2-4 years
Major risks: Voiding dysfunction, de novo urgency

Leach et al., J Urol 158: 875, 1997
TVT
TOT
TOT
TVT and TOT

- Minimally invasive – home same day
- Large worldwide experience
- Success rates similar to sling and Burch
- Risks of erosion of synthetic tape
- Risk of voiding dysfunction despite being “tension free”
Medical therapy

• No FDA approved medications for the treatment of SUI
Summary - SUI

- Newer injectables being developed, perhaps more long-lasting
- Advancement in minimally invasive surgeries
- Medical therapy still under FDA review
Male incontinence

- Much less common than women

- SUI quite rare unless previous pelvic surgery, or neurological condition

- Urge incontinence more prevalent, still less than women
WET 16%  DRY 84%

WET 55%  DRY 45%

Male OAB  Female OAB
Options for Male SUI

- Medications
- Pelvic Floor Exercises
- Injection therapy
- Male “sling”
- Artificial urinary sphincter
Medications for Male SUI

- Antihistamines
- Sudafed
- Medications with alpha agonistic properties
- Results variable, lifelong treatment necessary
Pelvic Floor Exercises

- In patients s/p prostatectomy, may quicken return of continence
- Likely will help patients with mild incontinence
- Works best in younger patients
Collagen injections

• Scar tissue at anastomosis prevents adequate coaptation

• Efficacy approximately 30-40%. Re-treatments common.

• Best in patients with mild (1-3 pads/day) SUI
Male sling

- Increase outlet resistance by placing mesh at bulbous urethra
- Best for patients with moderate SUI
- Avoids prosthetic
- Void naturally
Artificial Urinary Sphincter

- Longest track record
- Optimal results
- Prosthetic: risks of infection, device ware with time, need for manipulation, etc.
Artificial Urinary Sphincter

- Reservoir placed in retropubic space, fills cuff passively after voiding.
- Cuff surrounds urethra, occluding it.
- Pump sits in scrotum and is activated by squeezing with each void.
- Deactivation button; seldom used.
In Conclusion

- There are two types of incontinence, stress and urge, though some have mixed.
- Incontinence affects a large amount of the population, both male and female and it is costly.
- There are invasive & non-invasive forms of treatments.
Acknowledgements

• Dr. Gary Lemack

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