Urinary Incontinence: Overview, Evaluation and Management

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Objectives

- Differentiate types of incontinence
- Evaluation of the incontinent patient
- Treatment
  - Urge
  - Stress
  - Mixed
- Mesh Controversies
Definition

• Incontinence = involuntary loss of urine

• 3 Types of Incontinence
  • Stress Incontinence
  • Urge Incontinence
  • Mixed Incontinence
Pathophysiology of SUI
Urge Urinary Incontinence (UUI)
Mixed Urinary Incontinence (MUI)
Spectrum of Incontinence and OAB

- Urgency
- Frequency
- Nocturia

SUI  Mixed (UUI+SUI)  UUI  OAB
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%

**How Important is Incontinence?**

- **Treatment**
  - $667 million

- **Diagnostic test**
  - $390 million

- **Additional admissions**
  - $1.6 billion

- **Longer hospital stays**
  - $6.2 billion

- **Home care**
  - $4.2 billion

- **Falls**
  - $58.4 million

- **Urinary tract infections**
  - $4.2 billion

- **Skin care**
  - $380 million

- **Routine care**
  - $10.2 billion

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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

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

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

**Occupational**
- Absence from work
- Decreased productivity
QOL Impact: comparison to other conditions

# 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</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>

Evaluation
History

• History
  • Nature of incontinence
  • Severity of incontinence
  • Medical, neurologic, and genitourinary symptoms
  • Review medications
  • Evaluate functional and mental status
• GYN History
  • Parity
  • Type of Delivery
• Risk Factors Include
  • Obesity
  • Advancing age (link with menopause/estrogen)
DIAPPERS

- **D** = Delirium
  - Normal Pressure Hydrocephalus (Wet, Wacky, Wobbly)
- **I** = Infection (UTI)
- **A** = Atrophic vaginitis
- **P** = Pharmaceuticals/polypharmacy
- **P** = Psychological (depression)
- **E** = Excessive Urine production or Endocrine
  - DM, DI, diuretics
- **R** = Restricted mobility (arthritis, Parkinson’s, balance)
- **S** = Stool impaction (impairs pelvic floor muscle fxn)
DRIP

- **D** = Delirium
- **R** = Restricted mobility, retention
- **I** = Infection, inflammation, impaction
- **P** = Polyuria, pharmaceuticals
Medications

- Diuretics
- Antidepressants
- Antihypertensives
- Hypnotics
- Analgesics
- Narcotics
- Sedatives
- OTC sleep aids and cold remedies
- Antipsychotics
- Herbal remedies
Questionnaires

• Incontinence
  – Urogenital Distress Inventory
  – Incontinence Impact Questionnaire
  – IQOL
  – Bristol
  – King’s Health Questionnaire
  – MESA questionnaire
  – Many more....
# Urogenital Distress Inventory

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

<table>
<thead>
<tr>
<th>Condition</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 abdomen/genitalia</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Medical, Epidemiological, and Social Aspects of Aging Questionnaire (MESA)
Physical Exam

- Palpable bladder
- Position/size of meatus
- Check for leak with cough and valsalva
  - Hypermobility of urethra?
- Vaginal epithelium
  - Atrophy
- Vaginal Masses
- Vaginal Prolapse
- Use a hemi-speculum
  - Cystocele
  - Enterocele
  - Rectocele
Physical Exam

- Position/size of meatus
- Palpate urethra
- Bulbocavernosus reflex (BCR)
  - Absence usually associated with neurologic abnormality
- Rectal exam
  - Prostate size
  - Anal sphincter tone
  - BCR
- Testicles
Diagnostic Testing

- Urinalysis
  - Hematuria, Pyuria, Bacteriuria, Glucosurie, Pyuria
- Bloodwork as appropriate
- Uroflow/Residual
- Pad testing
- Voiding Diary
- Cystoscopy
  - High suspicion of urethral stricture, bladder cancer, stones, etc
  - Patients considering surgical intervention, unclear diagnosis or more conservative therapies have failed.
Urodyamics

- Bladder function test
- Pressure flow study
  - Leak point pressures
  - Sphincteric activity
  - Helpful in distinguishing mechanism of leakage (stress vs urge vs mixed)
  - Useful for complicated cases (prior incontinence procedures, neurological symptoms)
Treatment
Treatment Options

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

- Weight Reduction
- Smoking Cessation
- Avoid bladder irritants
- Timed Voiding
- Bladder Training
  - Void by a strict schedule
  - Suppress the urge to void
    - Keep body still, deep breaths, mental distraction, kegels
  - May decrease SUI and UUI episodes by 50%, but need a motivated patient!
- Fluid restriction (esp at night)
The Bladder Diet

- Apples
- Mayonnaise
- Bananas
- Apple Juice
- NutraSweet
- Sweet and Low
- Cantaloupes
- Peaches
- Soy Sauce
- Carbonation
- Pineapple
- Alcohol
- Chilies/Spicy Foods
- Plums
- Processed meats and fish

- Chocolate
- Strawberries
- Tofu
- Citrus Fruits
- Tea
- Yogurt
- Coffee (including Decaffeinated)
- Tomatoes
- Cranberries
- Vinegar
- Grapes
- Vitamin B Complex
- Guava
The Bladder Diet

- Caffeine
- Alcohol
- Spicy Foods
- Acidic Foods
- Citrus Fruits
Pelvic Floor Exercises

- Kegels
  - Learn to do correctly
  - 10 contractions, 3x daily, hold for 6-8 secs (also do prior to cough, sneeze, lift)
  - Continence improves 6-12 weeks after starting

- Regimented program required

- Efficacy controversial,
  - Effect lost once exercises stopped

- Requires motivated patient

- Biofeedback – teaches control of pelvic floor musculature by physiotherapist
Biofeedback
Pharmacotherapy

Central Mechanisms:
- GABA agonists, reuptake inhibitors, degradation inhibitors
- Dopamine D$_2$ antagonists
- Enkephalin mu ($\mu$) or sigma ($\sigma$) agonists
- Serotonin agonists, reuptake inhibitors
- Norepinephrine $\alpha$-1 or $\alpha$-2 antagonists
- Neurokinin (tachykinin) antagonists

Peripheral Mechanism:
- **Muscarinic antagonists**
- Beta ($\beta_3$) adrenergic agonists
- Prostaglandin antagonists (motor, sensory)
- Potassium channel openers
- Calcium channel antagonists
Muscarinic Receptor Subtypes

M$_1$: Cerebral cortex, hippocampus, glands, sympathetic ganglia

M$_2$: Hindbrain, heart, smooth muscle

M$_3$: Cerebral cortex, glands (eg, salivary), heart, smooth muscle

M$_4$: Basal forebrain, striatum

M$_5$: Substantia nigra

### Pharmacotherapy

- Bladder, M2 and M3 predominance

<table>
<thead>
<tr>
<th>DRUG</th>
<th>M3 RECEPTOR SELECTIVITY</th>
<th>SPECIAL NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxybutynin (Ditropan®, Ditropan XL®, Gelnique®)</td>
<td>No</td>
<td>Oldest drug in class Has been shown to cause confusion in elderly</td>
</tr>
<tr>
<td>Tolterodine (Detrol®, Detrol LA®)</td>
<td>No</td>
<td>Lipophillic (unlikely to cross BBB)</td>
</tr>
<tr>
<td>Darifenacin (Enablex®)</td>
<td>Yes</td>
<td>M3 Selective</td>
</tr>
<tr>
<td>Solifenacin (VESIcare®)</td>
<td>Yes</td>
<td>Long Half-life</td>
</tr>
<tr>
<td>Trospium (Sanctura®)</td>
<td>No</td>
<td>60% is excreted unchanged in urine---NOT metabolized by Cytochrome P450 Might exert a direct therapeutic effect on urothelium Less likely to cross BBB</td>
</tr>
<tr>
<td>Festoterodine (Toviaz®)</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>
Side Effects

- Side Effects
  - Dry mouth **
  - Dry eyes
  - Constipation
  - Blurred vision
  - Dyspepsia
  - Urinary retention **

- Contraindications: urinary retention, narrow angle glaucoma, gastric retention, intestinal obstruction, myasthenia gravis
Can you differentiate among antimuscarinics?

- Physiologically – yes
  - Route of delivery
  - Muscarinic receptor profile
  - Metabolism
  - Side effect profile (CNS, Constipation)

- Efficacy????
Important Trials

• OBJECT
  • Oxybutynin XR 10mg vs. Tolterodine 2mg (BID)
  • Both improve UUI, Frequency

• OPERA
  • Oxybutynin XR 10mg vs. Tolterodine 4mg

• ACET
  • 2 trials
  • Random open label 2mg or 4m XR tolterodine
  • Randomized to 5 or 10 mg XR Oxybutynin
Patient Compliance with OAB Drugs

Combination Therapy is Most Effective for Overactive Bladder

- Burgio et al\textsuperscript{1} evaluated the efficacy of combined behavioral and pharmacologic treatment for overactive bladder

- Patients
  - women $\geq$ 55 years of age with urge incontinence (twice weekly for at least 3 months)
  - previously received behavioral (anorectal biofeedback-assisted pelvic floor rehabilitation) or drug therapy (oxybutynin) alone for symptoms and were unsatisfied with that treatment\textsuperscript{2}

**Percent reductions in incontinence episodes after 8 weeks**

<table>
<thead>
<tr>
<th>1st Treatment</th>
<th>2nd Therapy</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug Therapy Alone (n=18) 59.1%</td>
<td>Switched to Behavioral (n=18) 77.1%</td>
<td>0.109</td>
</tr>
<tr>
<td>Behavioral Therapy Alone (n=8) 57.5%</td>
<td>Drug Therapy Added (n=8) 88.5%</td>
<td>0.034</td>
</tr>
<tr>
<td>Drug Therapy Alone (n=27) 72.7%</td>
<td>Behavioral Therapy Added (n=27) 84.3%</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Botulinum Toxin

- FDA approved in 2011 for neurogenic patients.

- Off label use in idiopathic patients
  - 100 units

- Has been shown in improve UDS parameters
Surgical Management

• Sacral Neuromodulation
  • Interstim
  • PTNS
Surgical Management

- Augmentation Cystoplasty
Continence Devices

- **Pessary**
  - Used primarily for prolapse
  - Inserted into the vagina

- **Catheters**

- **Urethral occlusive devices**
  - Stents, clamps, plugs, caps
  - Must be removed to void
  - Can cause spasms which can exacerbate incontinence
Surgical Options for SUI

- Periurethral bulking agents
- Retropubic suspension (Burch)
- Vaginal bladder neck suspension
- Pubovaginal sling
- Minimally invasive tension free slings
  - Retropubic MUS (TVT – trans vaginal tape)
  - Obturator MUS (TOT – trans obturator tape)
  - Advance Sling (Male)
- Artificial Urinary Sphincter (AUS)
Peri-urethral Bulking Agents

- Injected cystoscopically
- Increases bladder outlet resistance and reduces SUI
- May need multiple injections
- Can be followed by ultrasound
- Can be an office based procedure
- Minimal risk of voiding dysfunction
- Efficacy – 50-60%
- Re-treatments often required
Periurethral Bulking Agent

• Before Treatment

• After Treatment
Burch Colposuspension

• Burch Suspension
  – Perivesical tissue is sutured to Cooper’s ligament
  – Supports the bladder and the urethra
  – Good outcome (84% are dry at 4 years)
Pubovaginal Sling
Midurethral Slings

- 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”
SISTEr Trial

- Stress Incontinence Surgical Treatment Efficacy Trial
  - 2001, RCT by the UITN
- Assess efficacy of Burch versus PVS
- 655 women enrolled, (PVS=326, BC=329)
- Greater success noted in PVS (47% vs. 38%, p=0.01)
- Treatment satisfaction at end of 24 months was also higher in PVS (86% vs. 78%, p=0.02)
TOMUS Trial

• Trial of Mid-Urethral Slings
• Randomized controlled surgical trial comparing efficacy of RMUS and TMUS
• Measured objective and subjective measures of success.
• At end of study two procedures met pre-determined criteria of equivalence.
Artificial Urinary Sphincter

- Used most often in men after prostatectomy for SUI
- Made of 3 main components
- Default mode is for cuff to be inflated
- Manual dexterity
- Control pump is placed in scrotum for men, labia for women
- Control pump can be deactivated if necessary
When to Refer

• Continuous leakage
• Conservative measures are ineffective
• Not responding to medications
• Prior GU procedures
• Hematuria
• Recurrent UTI
• Neurologic disorder/SCI
A Few Words on Mesh
Have you been diagnosed with severe injuries internally & have **Vaginal Mesh**?

You may be entitled to compensation

**we can help!**