EVALUATION AND MANAGEMENT OF INCONTINENCE

Sumana Koduri, MD
Associate Professor of Ob/Gyn and Urology
Medical College of Wisconsin
Overview

- Impact of urinary incontinence
- Physiology of continence
- Etiology
- Work-up
- Treatment
ICS definition

“any complaint of involuntary loss of urine that is a social or hygienic problem”
Urinary incontinence

- 10-25% of women under age 65
- 15-30% of non-institutionalized women over age 60
- > 50% of institutionalized women

- Cost estimates $16.3 billion/yr
- Societal cost estimates $26 billion/yr (NIH)
Impact of Overactive Bladder on Quality of Life Compared to Other Conditions

Kobelt-Nguyen et al. 27th annual meeting of ICS, 1997.
Patients seeking treatment

- Only 25-30% of women seek treatment
- 45% feel incontinence is normal or not serious enough a problem
- 10% feel nothing will help the problem
- 4% too embarrassed to talk about the problem
Mechanism of continence

- **Extrinsic factors**
  - Normal anatomy
  - Good support to the bladder neck
  - Normal neurologic input

- **Intrinsic factors**
  - Skeletal muscle
  - Smooth muscle
  - Periurethral vasculature
Innervation of the LUT

Adapted from Abrams P, Wein AJ. The Overactive Bladder: A Widespread and Treatable Condition. Erik Sparre Medical AB; 1998.
Distribution of Cholinergic and Adrenergic Receptors in the LUT

Detrusor muscle (M,β)

Pelvic floor (N)

Trigone (α)

Bladder neck (α)

Urethra (α)

M = Muscarinic
N = Nicotinic
α = α₁-adrenergic
β = β₂-adrenergic

Adapted from Abrams P, Wein AJ. The Overactive Bladder: A Widespread and Treatable Condition. Erik Sparre Medical AB; 1998.
Reversible causes

- D - Delirium
- I - Infection
- A - Atrophy
- P - Pharmacologic
- P - Psychogenic
- E - Excessive urination
- R - Restricted mobility
- S - Stool impaction
Etiology

- Risk factors
  - Genetic predisposition
  - Vaginal delivery
  - Age
  - Parity
  - Smoking
  - Neurologic disease
  - Chronic pulmonary and GI disease
  - Occupational and recreational factors
Etiology

- Pregnancy and childbirth
  - hormonal effects of pregnancy
  - pudendal nerve injury (stretch/crush)
  - connective tissue changes
  - mechanical disruption of muscles and sphincters
  - increasing damage with multiparity
Etiology

- Aging
  - post menopausal hormone changes
  - connective tissue changes
  - neurologic changes
  - ? gravity
Etiology

- Chronic conditions
  - COPD/smoking
  - Chronic constipation
  - Neurologic diseases
  - Pelvic trauma/irradiation
Types of urinary incontinence

- Stress incontinence
- Urge incontinence
- Overflow incontinence
- Functional incontinence
- Incontinence due to deformity
- Mixed incontinence
Stress incontinence

- Loss of urine with increased intraabdominal pressure (i.e. with cough, sneeze, laugh, bending, etc.)

Etiology
- Loss of support of the bladder neck
- Loss of intrinsic urethral sphincter function
Urge incontinence

- Loss of urine associated with an abrupt and strong urge to void

- Most common cause or associated dx:
  - Motor urge incontinence
    - Idiopathic detrusor overactivity
    - Neurogenic detrusor overactivity
  - Sensory urge incontinence
    - Bladder pain syndromes
Overflow incontinence

- May cause stress or urge symptoms, or constant dribbling
- Associated with large residual volumes
- Etiology
  - Idiopathic
  - Neurologic conditions
  - Medications
    - Antidepressants
    - Anticholinergics
    - Cold medications
Other Causes

- Functional Incontinence
- Incontinence due to deformity
  - Urethral diverticulum
  - Genitourinary fistula
  - Congenital abnormalities
    - bladder extrophy
    - ectopic ureter

- Mixed Incontinence
Work-up

- History
  - Past medical and surgical history
  - Obstetrical history
  - Medications
  - Questionnaire may be used
  - History alone only 60% accurate for diagnosis
Work-up

- Voiding diary
  - 24 - 72 hr diary of input and output with leakage episodes
<table>
<thead>
<tr>
<th>TIME</th>
<th>AMOUNT VOIDED</th>
<th>AMOUNT LEAKED</th>
<th>ACTIVITY AT TIME OF LEAK</th>
<th>URGE PRESENT</th>
<th>FLUID INTAKE Type &amp; Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 AM</td>
<td>350 cc</td>
<td>0</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>7:30 AM</td>
<td>1</td>
<td>1</td>
<td>Coughing</td>
<td>No</td>
<td>Cup of Coffee</td>
</tr>
</tbody>
</table>
Physical examination

- Inspection
- Neurologic examination
  - lower extremities
  - mental status
- Pelvic examination
  - atrophy
  - genital prolapse
- Q-tip test
  - urethral hypermobility
Office evaluation

- Urethral catheterization
  - Urine culture
  - Urinalysis
  - Post void residual
    - Symptoms of post void fullness
    - Longstanding DM
    - History of urinary retention
    - Pelvic Organ Prolapse
    - Prior antiincontinence surgery
    - Failure of pharmacologic therapy
Office evaluation

- Stress testing
  - Bladder filled to a standard volume (250 ml)
  - Objective demonstration of urine loss
Office evaluation

- **Simple Cystometry**
  - Evaluation of involuntary bladder contractions
  - Work-up of urgency, frequency, urge incontinence and nocturia

- **Cystourethroscopy**
  - Direct visualization to rule out intrinsic bladder pathology
Who needs multichannel urodynamics

When simple tests simply don’t explain the problem
Multichannel Urodynamics

- Failed incontinence surgery
- Mixed incontinence
- Prolapse beyond hymenal ring
- Age over 50 / postmenopausal women
- Voiding dysfunction/Urinary retention
Multichannel urodynamics

- Urethrocystometry
- Urethral pressure studies
- Leak point pressure studies
- Voiding pressure studies
Urine leak

VLPP
Urinary incontinence can be treated!

Non-surgical treatment

Surgical treatment
Non-surgical treatment

- **Fluid management**
  - Decrease fluids in evening
  - Avoid caffeine and alcohol

- **Dietary changes**
  - Avoid acidic foods
  - Avoid potassium rich foods
"The red blobs are your red blood cells. The white blobs are your white blood cells. The brown blobs are coffee. We need to talk."
Non-surgical treatment

- Pelvic floor exercises
  - 60% success
  - Coaching
    - Empty bladder first
    - Voluntary contraction held for 10s
    - Relax for 2-3 s
    - Sets of 10 contraction thrice daily
- Vaginal cones
- Biofeedback
Thank God for all those years of doing my Kegels!
Not one for waking up in the middle of the night, Mary trained her bladder to use the bathroom on it’s own...
Continence devices

- Femsoft®
Pessaries

- Support devices to correct prolapse
- Pessaries to support bladder neck
- Introl®
Non-surgical treatment

- Hormone Replacement
  - Oral
  - Vaginal
    - Cream
    - Tablets
    - Estrogen ring
Medications

- To strengthen the urethra
  - Cold medications (eg: Pseudoephedrine)
- To relax bladder muscle
  - Anticholinergics (eg: Tolterodine, oxybutynin, etc.)
- To strengthen urethra and relax bladder muscle
  - Tricyclic antidepressants (eg: Imipramine)
- How about d/c ing contributing medications?
Muscarinic receptors are also located in the CNS.

Adapted from Abrams P, Wein AJ. The Overactive Bladder: A Widespread and Treatable Condition. Erik Sparre Medical AB; 1998.
Timeline of Available Antimuscarinics Since 1998

- **1998**: Tolterodine extended release (Detrol® LA)
- **2001**: Oxybutynin extended release (Ditropan XL®)
- **2003**: Trospium (Sanctura™)
- **2004**: Solifenacin (VESIcare®)
- **2005**: Darifenacin (Enablex®)

Please see full prescribing information.
Muscarinic Receptor Profile of various Antimuscarinics

Inhibition Constant Ratio (Kᵢ) for Muscarinic Receptor Subtypes

- Trospium: M₃/M₂ ratio 1.3
- Detrol® LA: M₃/M₂ ratio 3.6
- Solifenacin: M₃ ratio 12
- Oxybutynin: M₃ ratio 12.3
- Darifenacin: M₃ ratio 59.2

*Animal models.

Detrol® LA (tolterodine tartrate extended release capsules)

Please see full prescribing information.

Surgical treatment

- For Stress Incontinence
  - Burch procedure
  - MMK procedure
  - Sling procedures
  - Needle suspension procedures
  - Tension free transvaginal tape (TVT)(TOT)
  - Periurethral bulking agents
TOT
Surgical treatment

- For Urgency, Frequency, Urge Incontinence and Retention
  - Urgent PC
  - Sacral neuromodulation (Interstim®)
  - Botox injections
  - Augmentation cystoplasty
  - Urinary diversion
Urgent PC
Botulinum Toxin A
Thank you
Any questions?