Urologic Considerations in Parkinson’s Disease Patients

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Problem

Parkinson’s Disease patients have or are susceptible to any medical problem non-PD patients have or can get in addition to the problems known to define PD.
Parkinson’s Disease Symptoms

- Tremors, rigidity, bradykinesia, gait disturbances
- Cardiovascular – hypotension, arrythmias
- Gastrointestinal (50%) – constipation, sialorrhea, GERD
- Integument – sweating, seborrhea
- Thermoregulatory – heat/cold intolerance
- Neuropsychiatric – depression, apathy
- Genitourinary (60-80%) – voiding problems, sexual dysfunction
  (65% PD males > 37% healthy age-matched males)
  (36% PD females > ?)
Common Voiding Symptoms

- Frequency
- Urgency
- Urge incontinence
- Nocturia
- Weak stream/dribbling
- Sensation of incomplete voiding/Double voiding
## Possible Urinary Effects of Antiparkinsonian Agents

<table>
<thead>
<tr>
<th>Drug</th>
<th>Type</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cogentin</td>
<td>Anticholinergic</td>
<td>Urinary retention</td>
</tr>
<tr>
<td>Symmetrel (amantadine)</td>
<td>Anticholinergic</td>
<td>Urinary retention</td>
</tr>
<tr>
<td>Lodosyn(carbidopa)</td>
<td>Decarboxylase inhibitor</td>
<td>Frequency, incontinence</td>
</tr>
<tr>
<td>Mirapex</td>
<td>D2 receptor agonist</td>
<td>Frequency, incontinence</td>
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<tr>
<td>Permaz</td>
<td>D1/D2 receptor agonist</td>
<td>Frequency, incontinence</td>
</tr>
<tr>
<td>Sinemet (Carbi/Levodopa)</td>
<td>D1/D2 receptor agonist</td>
<td>Frequency, incontinence</td>
</tr>
</tbody>
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Neurologic Evaluation

• History/Bladder diary
• Quality of Life Assessment
• Physical Examination/Neurological Examination
• Urine tests (UA, Urine C&S)
• Renal function tests
• Radiologic Evaluations (Upper/Lower tracts)
• Endoscopy
• Urodynamics
Micturition Cycle

Bladder Filling & Urine Storage Requirements:

Reservoir:
- Accommodation of increasing volumes of urine
- Low pressure (compliance)
- Appropriate sensation
- Absence of involuntary contractions
  - Hyperreflexia
  - Instability

Outlet:
- Outlet closed at rest and during increases in intrabdominal pressures
Micturition Cycle

Urine Emptying Requirements:

Reservoir:
- Coordinated bladder contraction of adequate magnitude

Outlet:
- Absence of anatomic obstruction
- Concomitant lowering of resistance at level of smooth muscle of bladder neck and urethra, and striated muscle around the urethra
Voiding Dysfunction Classification

Failure to store:
- Because of the bladder
- Because of the outlet

Failure to empty:
- Because of the bladder
- Because of the outlet
Voiding Dysfunction Classification

• Failure to Store:

  Because of the Bladder:
  - Bladder hyperactivity
  - Involuntary contractions
  - Decreased compliance
  - Sensory urgency

  Because of the Outlet:
  - Stress incontinence
  - Non-functional bladder neck/urethra
Voiding Dysfunction Classification

- Failure to Empty:
  - Because of the bladder:
    - Neurologic/myogenic
    - Psychogenic
  - Because of the outlet:
    - Anatomic
      - Prostatic obstruction
      - Bladder neck contracture/Stricture
    - Functional
      - Sphincter dyssynergia
Uro dynamics
8 “C’s” of Urodynamics

- **Filling and Storage**
  - Contractions (Involuntary bladder)
  - Compliance
  - Continence
  - Capacity
  - Conscious sensation
- **Emptying**
  - Contractility
  - Complete Emptying
  - Clinical obstruction
Urodynamic Findings

**Bladder:**
- Normal = 25%
- Hyperreflexia = 67%
- Areflexia = 8%

**Sphincter:**
- Normal = 69%
- Bradykinesia = 7%
- Dyssynergia = 14%
- Uninhibited = 10%
Therapeutic Approach

Treat urinary dysfunction secondary to PD

+ Treat Non-PD conditions

(i.e., prostatic enlargement, stress incontinence, etc)

Problem – PD is slowly progressive for which only symptomatic treatment is available. PD treatment may alter GU function itself paradoxically.
**Therapeutic Options – Facilitate Storage**

**Inhibiting Bladder Contractility/Decreasing Sensory Input**
- Timed voiding
- Pharmacologic therapy
- Biofeedback, bladder retraining
- Bladder overdistention
- Interruption of innervation
- Cystoplasty

**Increasing Outlet Resistance**
- Pharmacologic therapy
- Non-surgical mechanical compression
- Surgical mechanical compression
- Vesicourethral suspension (SUI)

**Circumvent the Problem**
- External collecting device
- Intermittent catheterization
- Continuous catheterization
- Urinary diversion
Therapeutic Options – Facilitate Emptying

Increasing Intravesical Pressure
  - External compression, valsalva
  - Pharmacologic therapy
  - Electrical stimulation

Decreasing Outlet Resistance
  - At a site of anatomic obstruction or sphincter
  - Pharmacologic therapy

Circumventing the Problem
  - Intermittent catheterization
  - Continuous catheterization
  - Urinary diversion
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.
Requirements of Normal Sexual Function

**Brain**
- neurologic
- psychosocial
  - (depression/apathy/psychosis/cognitive impairment)

**Spinal Cord** (i.e. injury/surgery)

**Peripheral Nervous System** (i.e. diabetes)

**Vascular System** (i.e. atherosclerosis)

**Hormonal System** (i.e. hypogonadism)
Evaluation for Sexual Dysfunction

- History (meds/surgery/EtOh, QoL)
- Physical examination (including neuro)
- Genitourinary evaluation
- Blood tests – testosterone, kidney function, glucose
- ?Doppler with/without vasoactive Rx
Risk Factors for ED

- Cardiovascular and endocrine conditions
  - Diabetes mellitus
  - Coronary artery disease
  - Hypertension
  - Peripheral vascular disease
  - Hyperlipidemia
- Iatrogenic
  - Medications
  - Surgery

- Neurologic disease/injury
- Modifiable risk factors
  - Smoking
  - Inactivity
  - Alcohol/drug abuse
- Emotional disturbances
- Aging

Bacon CG, et al. Poster presented at: European Association of Urology; April 7-10, 2001; Geneva, Switzerland.
Signs & Symptoms of Low Testosterone

- Low sex drive
- Erectile dysfunction
- Reduced muscle mass and strength
- Decreased bone density
- Difficulty concentrating
- Depression
- Fatigue/Apathy
**POTENTIAL BENEFITS**

- Enhances energy level and mood.
- Increases lean body mass and muscle strength.
- Decreases total body fat.
- May improve sex drive and erectile function.
- Increases bone mineral density, which may lead to reduced fracture risk.

**POSSIBLE RISKS**

- May cause sleep disturbances (or “sleep apnea”) in men who are overweight or have lung disease.
- May cause breast discomfort.
- May increase red blood cell count.*
- May cause changes in blood levels of cholesterol.
- May impair sperm production, which may lead to infertility problems.
- May increase prostate size.**
Treatment Ladder for Erectile Dysfunction

Treatment doesn’t usually treat underlying cause of dysfunction!

- Androgen replacement therapy
- Phosphodiesterase 5 inhibitors (Viagra, Levitra, Cialis)
- Vacuum erection device
- Intracorporeal (penile) injection
- Penile prosthetics