Geriatric Pharmacotherapy Case Series: Overactive Bladder

Demetra Antimisiaris, Kristina Niehoff

Bob: A 75-Year-Old Male Living in an Assisted Living Facility

Bob is a 75-year-old resident of an assisted living facility where most residents are 65 years of age or older, are very active and reasonably independent. The residents have their own fully functional apartments with kitchens and laundry facilities as well as parking spaces for their cars, if they still have one. But they also have the option of eating in the facility’s dining room and receiving transportation assistance when they ask for it. Bob still has his own car and enjoys going out for drives, but lately he sticks close to his residence, even though he’d rather get out more.

History of Present Illnesses

Bob had been complaining of difficulty urinating, with several incidences of incontinence over the past month. The symptoms of overactive bladder are not new for him, but incontinence is not something he had previously had.

He is now afraid to leave the assisted living facility and has become a relative shut-in. His family and friends in the community are concerned because he is usually very social and enjoys going out to dinner and events with them. He moved to the assisted living facility because his wife died one year ago, and he was lonely living at home.

As the consultant pharmacist for the assisted living facility you happened to talk with Bob, and he seemed less cognitively engaged and less functional than you recall from previous visits. You asked the assisted living facility staff about Bob, and they reported that he was found wandering the hallways at 2 a.m. looking for the restroom. He appeared confused, which was unusual. The facility nursing staff contacted his physician, who ordered routine toileting, to the extent they could encourage Bob, and they prescribed oxybutynin 5 mg twice a day.
Past Medical History

Depressed mood (since his wife died a year ago), congestive heart failure, benign prostatic hypertrophy, and history of transient ischemic attack

Social History

Occasional alcohol use, never smoked

Physical Exam

(Informal PE) Height: 5'9", Weight: 155, Blood pressure: 110/65, Respiratory rate: +18, Heart rate HR: 72; Persistent ammonia odor and an 11-pound weight loss in the past 45 days

Medications

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dose</th>
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<tbody>
<tr>
<td>Paroxetine</td>
<td>20 mg daily</td>
</tr>
<tr>
<td>Tamsulosin</td>
<td>0.4 mg daily</td>
</tr>
<tr>
<td>Furosemide</td>
<td>40 mg daily</td>
</tr>
<tr>
<td>Digoxin</td>
<td>0.125 mg daily</td>
</tr>
<tr>
<td>Enalapril</td>
<td>20 mg daily</td>
</tr>
<tr>
<td>Metoprolol XL</td>
<td>25 mg daily</td>
</tr>
<tr>
<td>Spironolactone</td>
<td>25 mg daily</td>
</tr>
<tr>
<td>Oxybutynin</td>
<td>5 mg twice a day</td>
</tr>
<tr>
<td>Hydrocodone/APAP</td>
<td>5 mg/500 mg every 6 hours for back pain not relieved by APAP</td>
</tr>
<tr>
<td>Duloxetine</td>
<td>30 mg daily</td>
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</tbody>
</table>

Laboratory Results

Na =136 mmol/L, K = 4.7 mmol/L, Cl = 98 mmol/L, Dig = 1.2 nG/mL, Glu mg/dL = 112, Scr = 1.1 mg/dL, BUN = 28 mg/dL, Urinalysis: (-) for infection.

Keep in Mind

- Sometimes urinary incontinence is caused by over-relaxation of the bladder resulting in incomplete voiding per each toileting.
- Caution in persons with benign prostatic hypertrophy, the use of duloxetine and other sympathetic nervous-system-activating medications [venlafaxine, methylphenidate] can cause further urethral obstruction by activating the smooth muscle [instead of rhabdophincter] of the bladder neck and urethra to tighten via alpha-receptor activation.
- Older adults with urinary incontinence and overactive bladder avoid being away from home because they are afraid of incidents and being away from the restroom for long.
- The ability to be continent requires intact cognition, and persons with dementia and those with medications causing cognitive impairment sometimes don’t perceive they have to void or “forget” how to toilet.
- Management of urinary incontinence sometimes requires stopping anticholinergic medications, which seems counterintuitive when anticholinergic medications are a mainstay of OAB treatment.

Assessment

Bob has experienced a significant status change that developed relatively suddenly, which means it could be a physiological change, such as worsening benign prostatic hyperplasia (BPH), or a stroke, a medication change, and/or an environmental change. Looking at his medication use, the duloxetine was added just six weeks ago for neuropathic back pain (Table 1). Normally it is not good practice to use duplicate antidepressant therapy, and you sent a consult note last month asking the prescriber to either use one antidepressant or provide rationale for duplicate therapy. The doctor replied that she intentionally is using paroxetine for his anxiety and depression and low-dose duloxetine for neuropathic pain (Table 1).

Given Bob’s current symptoms: mental confusion, incontinence, and difficulty urinating, it seems that he might be experiencing overflow incontinence. He may not be toileting on cue as per usual because of mental confusion and somnolence caused by the addition of oxybutynin, a strongly anticholinergic medication. We should look for medications that relax the bladder leading to incomplete voiding as well as those that may obstruct the urinary flow given his BPH. Also, we need to assess the link to weight loss and impaired functional status.
Table 1. Medication Assessment

<table>
<thead>
<tr>
<th>Medication</th>
<th>Concerns</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paroxetine</td>
<td>Strongly anticholinergic, can relax the bladder and cause diminished appetite and mental confusion.</td>
<td>This selective serotonin reuptake inhibitor can be cross-tapered and switched for a less anticholinergic one such as citalopram or sertraline.</td>
</tr>
<tr>
<td>Duloxetine</td>
<td>Duloxetine is labeled for neuropathic pain, but also is used for stress incontinence. Duloxetine can diminish urinary flow by activating the alpha-receptor-controlled smooth muscle of the bladder neck and urethra. Opposite mechanism of action than tamsulosin.</td>
<td>Alternative treatment for Bob’s back pain, such as physical therapy, should be considered because duloxetine is likely a significant contributor to his incontinence by increasing his urinary flow obstruction, resulting in high postvoid bladder residual (along with relaxed bladder because of anticholinergic use).</td>
</tr>
<tr>
<td>Oxybutynin</td>
<td>Strongly anticholinergic, causes impaired cognition, somnolence, constipation.</td>
<td>His overflow urinary incontinence will likely diminish with the discontinuation of duloxetine and paroxetine and he will not need oxybutynin when that is addressed.</td>
</tr>
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</table>

Plan

- Discontinue duloxetine (taper dose down, then eliminate)
- Taper paroxetine by lowering dose to paroxetine 10 mg daily, and discontinue after a few weeks
- Start citalopram 10 mg daily for three weeks, then increase citalopram to 20 mg daily while discontinuing paroxetine
- Discontinue oxybutynin and encourage routine toileting

Outcome/Follow-up

On the next month’s pharmacy consult visit, you found Bob back to his normal talkative and social self. He reported that he went out with his friends for lunch the day before. His mental status seemed much improved, and his weight loss had stabilized. When asked about using the restroom unexpectedly (or overactive bladder), he said that problem was much better.

Discussion

The physiology of bladder voiding is complex and requires the appropriate function of the frontal cortex and other parts of the brain (Figure 1). Anticholinergic medications can impair the brain and appropriate function of the bladder, which is relaxed by anticholinergic medications. Also, alpha-receptors at the bladder neck and urethra, if activated (by sympathetic nervous-system-activating drugs), can cause the bladder to not void completely.1-3 Both pathways (relaxed bladder and activated bladder neck, and urethral tone), can lead to obstructed voiding and increased bladder postvoid residual and urine storage, leading to urinary frequency (leaking of urine as well).

The causes of overactive bladder (OAB) and urinary incontinence (UI) are complex and involve cognition, medications, imbalances of glutamate, serotonin, dopamine, gamma-aminobutyric acid, encephalin, and calcitonin as well as physiological impairment (as in BPH or spinal-cord dysfunction).4,5 The complexity of bladder function, includes the impact of the neurotransmitters on spinal neuronal tract. This complexity is a reason...
why most OAB and UI medications are not efficacious. Treating just one piece of the complex physiology of micturition can diminish the odds of successful treatment. Studies demonstrate that after the first four months of taking OAB medications, 95% of patients fail treatment and many discontinue because of intolerable side effects such as confusion, functional impairment, somnolence versus benefit of treatment.6

Bob did receive furosemide and spironolactone for congestive heart failure, and that can increase urinary frequency by increasing urinary output. But, typically after long-term use, the increased urinary frequency diminishes. In addition, Bob had more significant reasons for his OAB and UI. Furosemide and spironolactone in this case were less likely to be the cause of his new problems. However, any chance to appropriately taper off unnecessary diuretics is a chance to prevent dehydration, electrolyte imbalance, impaired kidney function, and urinary frequency because of increased urinary output. In Bob’s case, he is taking paroxetine and oxybutynin, which are strongly anticholinergic medications. Together they relax the bladder and make complete voiding more challenging. (Beta 3 agonists such as mirabegron also relax the bladder through activation of bladder vesicle beta-receptors) Duloxetine may obstruct urinary flow via sympathetic nervous system action on the urethral rhabdosphincter. He was taking tamsulosin (alpha blocker), which opposes the sympathetic symptom action for existing urinary flow blockage. Finally, Bob was receiving several medications that could lead to dehydration (furosemide, spironolactone) and syndrome of inappropriate antidiuretic hormone secretion or hyponatremia (paroxetine, duloxetine), which theoretically can lead to confusion; however, the oxybutynin and paroxetine anticholinergic load is the most likely cause.

Geriatric Clinical Pearls

The use of anticholinergics is often the go-to solution for UI and OAB; however, it is important to realize that an over-relaxed bladder can cause postvoid urinary residual that can lead to increased symptoms—rather than
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improved symptoms—for any patient with or without BPH. The newer class of beta-agonists also relax the bladder, as do anticholinergic agents, and should be used with caution in people with urinary retention.18

The additional impact of anticholinergic medications on cognition and functional status can make successful toileting very challenging. The lack of complete voiding from anticholinergics can be made worse in patients with bladder-voiding obstruction such as in the case of BPH, and sympathetic nervous system activation can worsen that dynamic. It is important to find out if the patient has had a postvoid residual bladder scan to know whether he or she is voiding completely.

People living with UI often become socially withdrawn and, added to pain syndromes, serious functional impairment can result. Drug-induced UI is a problem that is reversible by removal and replacement of the offending agent.9 Additionally, routine toileting and behavioral treatments (feedback, voiding diary, pelvic floor exercise) is considered first-line treatment by the American Urological Association.10 For older people with few functional impairments, nonpharmacological treatment has been shown to be very effective in reducing incontinent episodes. Pelvic muscle exercises reduce UI in 70% of patients after two to three months of training. Prompted voiding and assistive toileting programs are effective for a substantial portion of patients with UI.11, 12 Behavioral treatment can be combined judiciously with OAB medications for greater efficacy in those patients who are not able to robustly participate in behavioral treatment alone because of cognitive and physical functional impairments.13

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REFERENCES


