

Sleep and Nocturia in Older Adults

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KEYWORDS

• Nocturia • Multicomponent • Insomnia • Aging

KEY POINTS

- Among older adults, nocturia is common, often occurs because of multiple chronic conditions or predisposing factors, and frequently coexists with sleep dysfunction.
- Multicomponent treatment emphasizing lifestyle and behavioral strategies should be considered as first-line therapy for older adults with nocturia.
- If lifestyle modification and behavioral treatment are not sufficient, multiple drug therapy options are available with modest ability to reduce nocturia episodes.
- Drug selection for management of nocturia may depend on the patient's underlying vulnerability to drug side effects with particular attention to the potential for adverse effects related to cognition and mobility/falls.
- In patients who are refractory to therapies that target the lower urinary tract, clinicians should consider formal evaluation of sleep dysfunction as a contributing cause of nocturia.

INTRODUCTION

Nocturia, defined as the complaint of awakening from sleep at night to void, occurs with increasing frequency as adults age. A recent systematic review reports nocturia incidence at a rate of 11.5% per year in persons more than 60 years of age, which is 4 times the rate for adults aged 40 to 50 years.¹ Previous studies suggest that nocturia is clinically significant and bothersome when it occurs at least twice nightly,² and that bother from nocturia is related to the magnitude of sleep disruption, particularly when returning to sleep after voiding is problematic.³ At least 30% of older adults experience 2 or more episodes of nocturia per night.⁴⁻⁶ Nocturia is associated with multiple negative health outcomes among older adults, including reduced quality of life, incident falls,

sleep disturbance, and increased mortality.⁷⁻¹⁴ Among older adults, nocturia typically occurs in the setting of multiple potential causes or risk factors, which lead to lower urinary tract dysfunction, increased urine production (either 24 hour or nighttime), sleep dysfunction, or a combination of these conditions.¹⁵ This article considers the intersection of nocturia and sleep disturbance and recommends that a multicomponent approach is warranted to treat nocturia with comorbid sleep dysfunction in older adults.

MULTIFACTORIAL ASSESSMENT OF CONTRIBUTING CONDITIONS

Common Comorbid Conditions

Nocturia shares many features of a geriatric syndrome because it constitutes a combination of

Disclosure: Dr C.P. Vaughan's spouse is a full-time employee of Kimberly-Clark Corp. Dr D.L. Bliwise received fees from Ferring, Merck, and Vantia, and grants from the New England Research Institute.

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Sleep Med Clin ■ (2017) ■-■

<https://doi.org/10.1016/j.jsmc.2017.09.010>

1556-407X/17/Published by Elsevier Inc.

symptoms and signs that occur more often in older adults, leads to substantial morbidity, and occurs in the setting of multiple interacting and synergistic risk factors.¹⁶ Nocturia may occur because of dysfunctional bladder storage, conditions associated with polyuria (ie, increased 24-hour urine production), nocturnal polyuria (ie, increased production of urine at night compared with daytime), or sleep disorders. However, in older adults, these conditions frequently coexist in the same individual and so the cause of nocturia is multifactorial. In addition, the relationship between sleep disruption and nocturia is bidirectional, which offers additional options for multicomponent treatment approaches.¹⁷ The implication of this bidirectionality is that focusing treatment on sleep and sleep disorders may also reduce nocturnal voiding episodes. The initial evaluation of an older adult with nocturia and sleep disruption includes an assessment of contributing comorbid conditions. **Box 1** provides a summary of conditions to consider.

Medication Review

Providers should conduct a careful medication review to assess for drugs that increase nighttime

urine production or polyuria. Strategies to modify medications include prescribing an alternative therapy or adjusting the timing of medications to reduce the impact on nighttime urine production. Commonly prescribed medications associated with nocturia include anticholinergic drugs, which cause dry mouth (which could lead to excessive fluid intake) and increase the risk of urinary retention. Calcium channel blockers may lead to salt diuresis by blocking proximal tubular secretion of sodium reabsorption or indirectly through promoting peripheral edema with overnight recirculation of dependent edema during recumbency. Diuretic therapy may be timed to avoid overnight diuresis and maximize the drug's effect during the daytime hours.

Physical Examination and Clinical Evaluation

The physical examination and additional assessments are targeted to determine contributing factors related to nocturia. If the patient has conditions that could contribute to volume overload (such as a history of congestive heart failure, liver or kidney disease), an evaluation of volume status is important. For men with symptoms consistent with overactive bladder, a rectal examination should be performed to assess for prostate enlargement. A rectal or vaginal examination also provides an opportunity to teach pelvic floor muscle contraction, which can be used as part of a behavioral therapy approach to nocturia.

Laboratory evaluation should include a urinalysis to assess for microscopic hematuria (defined as more than 5 red blood cells per high-powered field on 2 consecutive urinalyses without evidence of infection). If a urine culture is obtained, clinicians should consider that asymptomatic bacteruria occurs in up to 20% of older women and 15% of older men.¹⁸ Diagnosis of a urinary tract infection requires new patient-reported symptoms such as urinary storage symptoms, dysuria, or suprapubic pain, and culture of 1 bacterial species in a quantitative count of at least 10^5 colony-forming units (CFU) per milliliter in women and 10^3 CFU/mL in men.¹⁹ Serum prostatic specific antigen (PSA) level is not routinely recommended in the assessment of men with lower urinary tract symptoms. The PSA test received a D recommendation (ie, harms outweigh benefits) from the United States Preventive Services Task Force. As of 2013, the American Urinary Association recommends shared decision making among men who are at average risk between the ages of 55 and 69 years in order to determine each man's values and preferences for PSA testing. Other testing may be indicated based on the patient's comorbid conditions,

Box 1 **Conditions associated with nocturia among older adults**

Conditions associated with detrusor hyperactivity

- Benign prostatic enlargement
- Overactive bladder
- Medication side effects
- Kidney or bladder stones

Conditions associated with polyuria or nocturnal polyuria

- Congestive heart failure on diuretic therapy
- Chronic kidney disease
- Diabetes: poorly controlled
- Lower extremity edema
- Excessive fluid intake
- Obstructive sleep apnea
- Diabetes insipidus

Conditions associated with sleep dysfunction

- Obstructive sleep apnea
- Rapid eye movement sleep behavior disorder
- Restless legs syndrome
- Periodic limb movement syndrome
- Shift work syndrome

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